

THE Soybean Digest

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EDITOR'S DESK

Good Sense for Long Run The campaign, initiated in the *Soybean Digest* several months ago, to encourage farm and local elevator storage of soybeans from the 1947 crop, has gained momentum during recent weeks. The farm press has joined us in pointing out the advantages of holding a portion of the crop on the farm until the heavy marketing season has passed. PMA officials have joined us in several states, using our figures and those of Dr. Jordan of the University of Illinois to substantiate their recommendations. Conversation with elevator operators confirms our belief that a greater percentage of the 1947 crop of soybeans will be held on farms than in any year since before the war (when production figures were far below present levels).

The wisdom of holding the 1947 crop on farms where storage is available remains to be seen. Conceivably there could be losses from storage in those cases where beans were too high in moisture percentage, going out of condition. There is always the possibility of lowered prices if we head into the projected economic tailspin about which economists have been talking.

But over a period of years the fact still remains that the man who sold his soybeans in June received 32c per bushel more for them than though he had sold them in October or November. Only by an orderly process of marketing will we receive maximum returns for the crop. That includes storage at point of origin.

Don't Sell Us Short Those postwar adjustments about which we have all heard are now being made in the fats and oils industry. The cottonseed crop for the current year now appears to be about 20 percent larger than in 1946. More cottonseed oil, therefore, will be available.

A short corn crop will mean heavy liquidation of hogs during coming months. That will mean additional supplies of lard added to the already somewhat burdensome stocks now in storage.

Copra and coconut oil supplies from the Philippines have jumped far beyond expectations.

The 1947 soybean crop now appears to be somewhat smaller than that of a year ago, due to reduced yields as a result of unfavorable weather conditions. But probabilities are there will be 140 million bushels of soybeans for crushing purposes.

And these supplies all add up to what appears to be a supply of fats and oils well above that of the past few years! Unknown factor, of course, is our export policy after January first, and the degree of acceptance and execution of the Marshall Plan. With a shortage of dollar exchange, exports of fats and oils cannot be expected to be large unless backed by our own loans or grants. With considerably larger supplies of peanut and soybean oils going for export during the fourth quarter of the year, there are still no surpluses of fats and oils in sight. The only possible oversupplies will be those brought about by inflation-induced high prices and consequent low consumption.

During the war years soybean oil has gained a foot-

hold in many markets which it had never penetrated. In many of them it has advantages. In others it has shortcomings. Improved techniques in processing and refining now make soybean oil a factor which must be reckoned with in our domestic markets and on a world basis. Never again will the United States find it necessary to import one half the fats and oils consumed!

As stated above, the postwar adjustments are now under way. And don't sell soybean oil short! What other oil has as many potential uses in the edible, drying and industrial fields?

Practical Way to Help

Except in an indirect manner the problems of foreign feeding have not been of concern to the soybean industry. Soy flour has been purchased by the Army and by foreign governments for use in feeding the populations of other sections of the world, but the average grower of soybeans has had no direct connection with such programs.

Out on the west coast a prominent restaurant man, C. E. Clinton, for years has been interested in feeding people efficiently and cheaply. When the present emergency arose, research grants were established at California Institute of Technology, where Dr. Henry Borsook developed Multi-Purpose Food, described in an article written by Paul De Kruif for the September 1945 *Reader's Digest*.

The protein of MPF is derived from soybeans, acknowledged as the best supplier of vegetable proteins. Available in abundance, MPF can be shipped in one-tenth the space required for most foods of comparable food value, costs less, keeps indefinitely, requires no special handling. Two ounces (dry weight) when cooked with water provide one-third of a normal day's food requirements, is the approximate nutritional equivalent of a meal of beef, green peas, milk and potatoes.

The Meals for Millions Foundation, Inc., has been established to make MPF available at the lowest possible cost. For 3c you can feed a hungry, unseen guest somewhere in the world. For \$1 you can feed 33 persons one meal, or one person for 11 days. You may purchase MPF, send it yourself; have it sent direct by Meals for Millions Foundation, to any person designated by you; or you may make your contribution and ask the Foundation to send it where most needed.

With soybeans selling at over \$3 per bushel, is it not proper that soybean growers invest in one of the greatest peace-promoting bargains in history—at 3c per meal? — That a portion of the returns from the current crop be used to promote peace in a world where hunger is rampant?

Send your contributions directly to the *Soybean Digest*, and we will see that they are forwarded as directed by you. Or, write directly to MEALS FOR MILLIONS, 648 South Broadway, Los Angeles 14, Calif.

Convention Now History

The 1947 convention of the American Soybean Association is now history. Not the largest in history, it was characterized by a splendid field trip at Ohio State University farms, by many side conferences between individuals trying to outguess the turn of events during coming days, by intense interest in the hour-by-hour market reports, and by an unusual interest in equipment and supplies for plant operations.

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GROWERS

Effect of Soybean Straw

Corn stover, cereal straws, and soybean haulm left in the fields are burned on many farms prior to preparing the land for the crop that follows, states L. E. Thatcher of the Ohio Experiment Station. Probably the main reason for burning these crop residues is that farmers have learned through experience that the return of these materials to the soil is very likely to depress the yield of the non-leguminous crops following immediately in the rotation.

RESIDUES MAY DEPRESS YIELDS

These materials often have a depressing effect on yields because they contain only about one-half of one percent of nitrogen (a constituent of the protein), and a relatively large amount of carbon as found in the cellulose, starch, sugars, fats and other carbohydrate materials.

These carbonaceous residues are energy foods for soil micro-organisms, but are too low in nitrogen to enable them to build the protein of their cell bodies. In meeting this emergency the soil micro-organisms take from the soil itself the extra nitrogen that they need for a balanced ration. Unless the soil is very well supplied with nitrogen, a crop occupying the soil at the time may suffer from nitrogen starvation and its growth be depressed accordingly.

If the soil's supply of available nitrogen is high enough there is no depression of growth; in fact the results may be altogether beneficial, as the soil's supply of humus is increased and the nitrogen supply conserved.

Soil biochemists have demonstrated many times that residues containing about 2 percent nitrogen or, if lower than that, reinforced with commercial fertilizer nitrogen, decompose readily without any draft on soil nitrogen. The same result is obtained when straw or stover are plowed down with a good nitrogen-rich legume sod. A sweet clover green manure crop is an ideal crop with which to incorporate low-nitrogen crop residues.

Iowa Field Day

"Soybeans should be used to replace corn in the rotation—not to stretch out the rotation for an extra year," farmers attending the corn-soybean field day at Iowa State College were told September 18. Adding soybeans to a current rotation means row crops on the land for a larger proportion of the time, and more losses in fertility through erosion and cropping.

Corn yields following soybeans, however, are higher than corn yields following corn. Increases of 5 bushels per acre were secured on corn following soybeans, as com-

pared with corn following corn, over a 2-year period.

Plantings of soybeans demonstrating different planting dates and different varieties were displayed to the crowd, which was broken into smaller groups for the field trip. Ranging from the earliest to the latest maturing varieties, there were soybeans which had already dropped all leaves and were ready for combining, and there were other rows just in bloom.

Intense interest was displayed in the plantings of the new early variety of soybeans which has been developed for northern Iowa, and in the Lincoln, which occupies more acreage than any other variety now being grown in the state.

In charge of the soybean demonstrations at the field day were C. R. Weber, in charge of the USDA soybean breeding work at Ames, and Dr. I. J. Johnson, head of the Farm Crops Department at Iowa State College.

Of especial interest to many field day visitors were the plantings which had been made to demonstrate the selection and development work necessary in the production of a new variety of soybeans. Several lines which show promise but which have not yet had sufficient testing to prove their merit were shown to visitors.

Combine Early

Begin combining soybeans for grain as soon as possible after the beans are dry to avoid shattering, advises Dale Hull, Iowa State College agricultural engineer.

If the pods are fully matured and the beans are hard, it is a good indication that they are ready to harvest. The most efficient method of combining is direct from the standing stalk.

Immature beans probably will not be ready for harvest as soon as the beans that are more mature at the time of the first frost. Even though they may show a green tinge, Hull recommends that immature beans caught by the first frost should be combined if the pods are filled.

Combines need to be adjusted differently for soybeans than for other grains. To prevent excessive cracking, the speed of the cylinder should be reduced to approximately half of that for other grains. The concave teeth may be removed entirely for dry mature beans. If the pods are a little tougher, blank concaves can be used.

Split and cracked beans may be caused by tailings being returned to the cylinder, Hull continues. By proper adjustment of the screens, sieves, air blasts and tailing fingers, cracking can be kept to a minimum.

The operator can determine when his machine is producing the proper threshing action and still not damaging the beans by examining the straw behind the combine. Unthreshed pods in the straw mean a need for increased threshing action. Hull recommends as much clearance and as slow a cylinder speed as you can have and still beat the grain from the straw.

CASE HISTORY NO. 19
One in a series of factual experiences telling how and why various American manufacturers use St. Regis Packaging System.

Here are the results this company got with a St. Regis Packaging System

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3. Elimination of the nuisance of refilling used bags.
4. Increased packaging output per man-hour.
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St. Regis Packaging Systems are designed to meet a wide range of product requirements and plant layouts. Packers are available in a variety of sizes and types, with filling speeds as high as twenty-four 100-lb. bags per minute—with one operator. Nearly 400 commodities—rock products, fertilizers, chemicals, foods, and feeds—are now being packaged in sturdy, low-cost multiwall paper bags.

How mechanized bag filling took the dust out of old-fashioned methods at New Jersey Pulverizing Company

Up until fifteen years ago the New Jersey Pulverizing Company, Pinewald, N. J., was packaging its screened and pulverized sand products in the usual heavy, old-fashioned fabric bags. Not only were these bags expensive, but the packaging operation was slow and exceedingly dusty.

Today the company is using seven 100-GF and two 100-FL St. Regis valve bag filling machines and multiwall paper valve bags. Dust is reduced to a minimum, costs are cut, output is increased.

The company also finds that Multiwalls, whether in storage or in transit by freight car or by truck, keep their product dry and free from caking. This is important to many of the company's customers.

A. B. Schlesinger, president of the company, comments on the economy of his St. Regis Packaging System: "It cuts the initial

investment in containers and reduces the per-ton packaging cost so that some of the present-day increased cost of labor and of plant operation is absorbed. Multiwalls have greatly speeded up our packaging. Moreover, we like Multiwalls because the nuisance of having old bags refilled is eliminated. Our customers appreciate the one-trip paper bag, too."

Says Benjamin Fisher, plant superintendent: "The St. Regis System solved our problem of dust in the packaging operation, and workers found paper bags easier to handle."

Mail the coupon for a detailed report, with pictures, of the New Jersey Pulverizing Company's use of St. Regis multiwall paper bags and bag filling machines. It may suggest how a St. Regis System can save money for you and give you better packaging.



At this plant filled bags are moved by hand-trucks directly to trucks or to box cars. Multiwalls protect the product against moisture-vapor penetration in transit and in storage.



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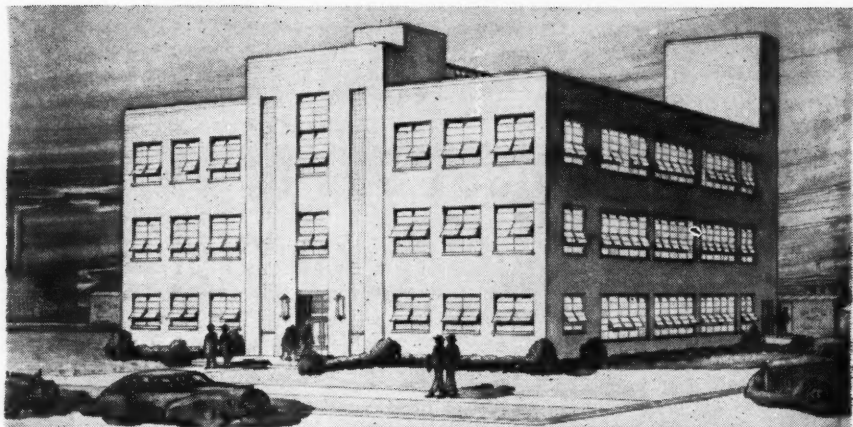
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Pilot plant which is nearing completion at A. E. Staley Manufacturing Co., Decatur, Ill. Architect's drawing shows how the building will appear when completed. Proposed new manufacturing processes and plant layouts will be tested in this building before final approval is given for the projects.

25 YEARS AS A PROCESSOR

Celebrating the 25th anniversary of the beginning of its soybean processing operations, A. E. Staley Manufacturing Co. was honored at the annual dinner of All-Illinois Agricultural Conference, Decatur, Ill., September 20.

A. E. Staley, Jr., president of the company, was presented with a large bronze plaque from the Association by John McCaffery, president of International Harvester Co., principal speaker.

Inscription on the plaque read:

"Presented to A. E. Staley Manufacturing Co. on the 25th anniversary of its first soybean processing operations, in recognition of the pioneer work of A. E. Staley and his associates which has meant so much to the farms of Illinois and other states and the city of Decatur. Association of Commerce of Decatur, Illinois. Sept. 30, 1947."

Staley's points out, in an anniversary booklet entitled "The Wonder Bean," that when the firm began its processing operations, the soybean was almost unknown to American farmers. Now it is the fourth largest cash grain crop, surpassed only by corn, wheat and oats.

When the late A. E. Staley was in the starch business in Decatur and worrying about the decline in productivity of farm acres which were being depleted by successive plantings of corn during the years of World War I, he remembered how valuable soybeans had been—back on the home farm in North Carolina in the years just after the Civil War—in building up soil through use in crop rotation.

And so, from 1916 to 1922, Mr. Staley had representatives travel throughout the Midwest, extolling the virtues of soybeans.

The campaign was a gradual success. From 1914, when only 1,000 acres of soybeans were grown for seed, the figure doubled each year. By 1919 the planting was 15,000 acres and 30,000 bushels of soybeans were threshed out.

When farmers started threshing soybeans, instead of growing them for hay or to plow back into the ground to enrich the soil, they began looking for a market for the threshed beans. This demand caused Staley to announce he would put in a soybean processing

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⁶⁰⁰
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plant at Decatur, Ill., which would buy all beans offered from the 1922 crop.

The first unit, although its capacity was only 500 bushels daily, operated only 74 days during the 1922-23 season, because of the lack of beans. Mr. Staley was optimistic, however, that more would be grown, and kept on increasing the size of the unit.

Public unfamiliarity with soybean oil and meal prompted Staley's to undertake educational work in conjunction with a sales program. Demand for soybean oil meal was whetted by articles in *The Staley Journal* and in farm publications and gradually created a market among feed dealers.

Staley's 2 million dollar hexane extraction plant began operation in 1945, and supplements operation of Staley's expeller plants at Decatur and Painesville, Ohio. Capacity of the extraction plant alone is 40 times the capacity of Staley's first unit.

A. E. Staley, Jr., president of A. E. Staley Mfg. Co., Decatur, Ill.



SOYBEAN OIL TASTE PANEL

The quality of your salad dressing may depend on somebody else's good taste. Ways and means of improving the flavor stability of soybean oil are being investigated by the U. S. Department of Agriculture at the Northern Regional Research Laboratory, Peoria, Ill. This has necessitated a taste panel whose job is to evaluate the oils which have received various treatments in the refining process.

Soybean oil is often used in making salad dressings. In 1946 this oil constituted 55 percent of the fat in margarine and was much used for deep-fat frying of food, such as for potato chips and doughnuts. Laboratory tasters of oil at the Department's laboratory must undergo rigorous tests themselves, as few persons can meet the requirements of keenness of taste and smell and accuracy of judgment in this field.

They must be able to detect small differences in taste, smell or concentration; to make correct identifications; to be consistent; and to disregard personal preferences or interests. Oil tasters, like professional tasters of wine and smellers of perfumes, are the last word and authority on quality.

No tests have been devised which equal the human senses in judging the savor of food or drink, or in this instance, the ability to evaluate oils. The Greeks had a word for testing oils by the senses, and scientists call it "organoleptic evaluation."

Members of the panel, in scoring the oil have a choice of 10 ratings, ranging from bland through good, objectionable, unpleasant, down to repulsive. Paired samples are presented to the testers and they begin by smelling both samples, then taste first the one having the least odor, on the assumption that the sample having the least odor will also have the mildest flavor. This method avoids dulling the senses. After the testing and scoring are complete, the members of the panel may discuss and compare valuations.

After the testing is finished, the panel



Panel taster who struck something rancid is getting his "reward" cookie.

member receives a cookie as a reward for his work—the cookie, incidentally, removing any unpleasant after-taste. Discussion of results by the panel members helps greatly to keep up the interest and morale of the testers.

The panels are credited by scientists with promoting substantial progress in solving the flavor problems of soybean oil processing.

— s b d —

PROCESSORS ELECT

W. H. Eastman, General Mills, Inc., Minneapolis, was elected vice president and chairman of the executive committee of the National Soybean Processors Association September 10. He succeeds D. J. Bunnell, Central Soya Co., Inc., who held this position for the past 2 years.

Other officers are R. J. Houghtlin, Chicago, president; W. L. Shellabarger, Shellabarger Soybean Mills, Decatur, Ill., secretary, and H. E. Carpenter, Lexington (Ohio) Soybean Processing Co., treasurer. F. G. Duncanson, Chicago, is assistant treasurer.

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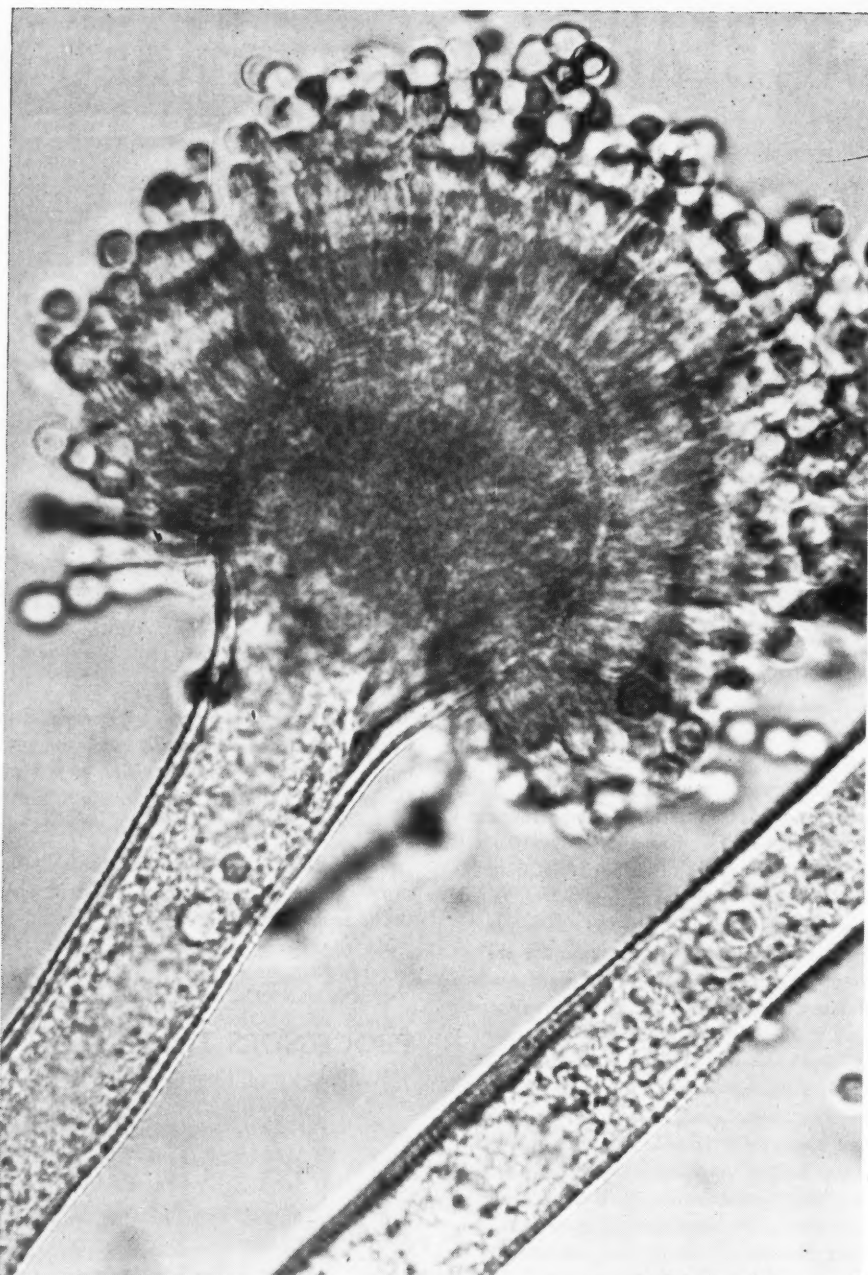
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This is not an atom bomb, but a single spore of the green mold, *Aspergillus Oryzae*, greatly enlarged, that is used in the preparation of Chinese soya sauce.

By **LEWIS B. LOCKWOOD**

Northern Regional Research Laboratory¹, Peoria, Ill.

DURING the past few years interest in the manufacture of Chinese soya sauce has resulted in many inquiries to the Northern Regional Research Laboratory requesting methods of preparation applicable for production of the sauce on a factory scale. Methods suitable for American firms have been practically non-existent. In China preparation is largely a household art. American efforts, therefore, have posed the problem of retaining the artistry of the Chinese but otherwise attaining such precision in the processing steps that a product of unvarying quality could be made by workers unskilled in methods of preparation as practiced in Chinese homes. This applies particularly to the use of molds and bacteria in the application of pure-culture techniques, because preparation of the sauce is based primarily on the action of microorganisms in the fermentation steps. The preparation of some of the Oriental fermented food products has been briefly described by Dyson (1) and Staley (2).

An excellent opportunity was presented recently for testing various processing methods for soya sauce while Mr. Pei Sung King, National Bureau of Industrial Research, Chungking, China, was a guest worker in the fermentation division of this Laboratory. The method described here is based on Mr. King's information and experience and on trials of various methods and results of test runs. It is offered not as the only method available but as one which has given consistently good results by the techniques employed—and which are applicable to large-scale manufacture.

The preparation of soya sauce involves two distinct steps: (1) the preparation of kojis (Chinese for cultures), and (2) the brine fermentation.

The first step consists of four different activities:

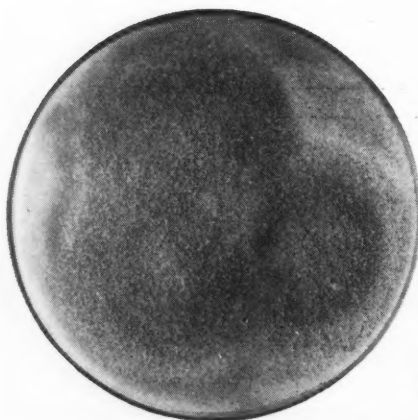
- a. Preparation of the mold kojis.
- b. Preparation of the yeast koji.
- c. Preparation of the lactic acid bacterial koji.
- d. Preparation of the soya koji.

PREPARATION OF KOJIS

Preparation of the mold kojis—The mold

¹One of the laboratories of the Bureau of Agriculture and Industrial Chemistry, Agricultural Research Administration, U. S. Department of Agriculture.

The Production of Chinese Soya Sauce



• *The quest has been for a method of preparing Chinese soya sauce that would retain the artistry of the Orient but be adaptable to Oriental methods. The Northern Regional Research Laboratory was fortunate in enlisting the aid of Mr. Pei Sung King, of the National Bureau of Industrial Research, Chungking, China, in this work.*

At left, a petri dish culture of the mold, natural size.

kojis used are prepared in the following manner: Rice is cooked in boiling water until soft and the excess water is then poured off. Next, two portions are sterilized in a pressure cooker, cooled, and each is inoculated with spores of a different strain of green mold. Suitable strains of *Aspergillus oryzae* are used. Since many strains of *A. oryzae* give sauces of poor quality, only tested strains should be used. These kojis are ready for use as soon as they are covered with green mold growth (3 to 5 days). A stock of the mold can be kept on cooked rice for long periods.

Preparation of the yeast koji—Any of a wide variety of solutions commonly used for the culture of yeasts and bacteria may be used for cultivation of the yeast. A satisfactory broth may be prepared if soybeans are soaked overnight, the water drained off, 1 quart of fresh water added for each 3 ounces of soybeans (original weight), and cooked for 1 hour in a pressure cooker at 15 pounds pressure. The broth is poured into bottles (about half full), the necks of the bottles plugged with cotton, and the broth then cooked for 15 minutes in a pressure cooker at 15 pounds pressure. The yeast should be a suitable strain of *Zygosaccharomyces soyae*, or of the genus *Hansenula*. The yeast should be grown at 30° to 35°C. (85° to 95° F.) and should be used when the culture is from 1 to 4 days old. However, it can be kept in a refrigerator for several weeks after it has grown for 2 days at the higher temperature.

Preparation of lactic acid bacterial koji—The lactic acid bacterium (*Lactobacillus delbrueckii*) is grown in the same kind of broth and stored under the same conditions as is the yeast. Better growth of the bacterium will occur at 35° to 40°C. (95° to 105°F.) than at 30°C. (85°F.). The

culture should be used when it is 1 to 4 days old.

Preparation of the soya koji—This step involves the use of the materials prepared in the steps just outlined, that is, the mold, yeast, and lactic acid bacterial kojis. The procedure for preparation of the soya koji is as follows: Five pounds of soybeans are soaked for 20 hours in 1 gallon of water. The excess water is drained off and the beans are then cooked 3 hours in a pressure cooker at 15 pounds pressure, which gives a cooking temperature of 120°C. or 248°F. After the cooking, 2 pounds 3 ounces of coarsely ground parched wheat (the grains should float on water) is mixed thoroughly with the beans, and this material is spread out in 2-inch layers in wooden or metal trays.

Next, the four kojis already described are mixed very thoroughly with the beans on the trays, after which the trays are stacked in a manner that will permit air circulation. The layer of beans should not be greater than 3 inches in depth. The temperature should be about 30°C or 85°F. Within 4 to 5 days this mass, known as the soya koji, will be covered with a growth of green mold, and it will be ready for use in starting the second step of the process—the brine fermentation.

THE BRINE FERMENTATION

The green-colored soya koji prepared in the preceding step, when ready for the brine fermentation, is put into a deep vessel and brine is added. The brine contains 2 pounds 1 ounce of table salt per gallon, and 1 gallon of brine is added to the koji for each 5 pounds (based on initial weight) of soybeans. This mash is kept warm (35°-38°C. or 95°-100°F.). After 30 to 90 days the mash is strained and pressed to obtain the sauce liquor. This liquor is then heated almost to boiling for

20 minutes, and alum (1 ounce to 700-800 pounds or 80 gallons) or kaolin (1 ounce to 1 gallon) is added for clarification. The sediment is allowed to settle overnight and the sauce is then filtered. From this first filtering comes the first or highest grade sauce.

A second grade sauce is prepared by adding hot water to the press cake (about 1¼ gallon to the press cake from 5 pounds of soybeans), mixing thoroughly, and then pressing the cake again. The second grade liquor is clarified in the same way as the first grade sauce. In the end, three-fourths of a pound of table salt is added for each 5 pounds of soybeans originally used.

Since the two grades of sauce have the same flavor, they can be mixed. The free amino nitrogen content of the first grade sauce should have a range of from 0.45 to 0.5 percent. Caramel is sometimes added to the sauce to give it a darker color and greater viscosity.

PRODUCTION YIELDS

Five pounds of soybeans should yield 12½ pounds of first grade and 10 pounds of second grade sauce, or about 2½ gallons total yield.

MICROORGANISMS ARE AVAILABLE

Satisfactory microorganisms for the preparation of the kojis, the yeast culture and the lactic acid bacterium culture are available in the culture collection, fermentation division, of the Northern Regional Research Laboratory. These organisms are:

Aspergillus oryzae NRRL 1988
Aspergillus oryzae NRRL 1989
Hansenula NRRL Y1096
Lactobacillus delbrueckii NRRL B445.

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FISH SOLUBLES PLANT

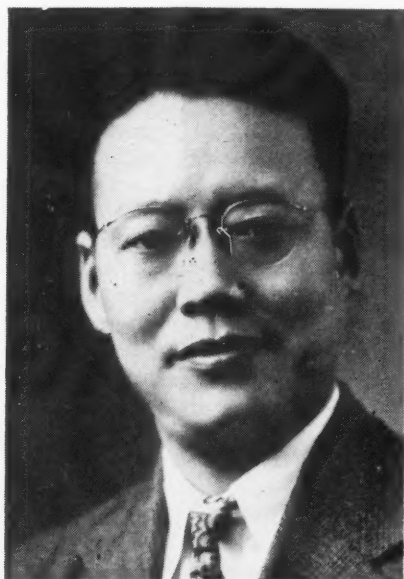
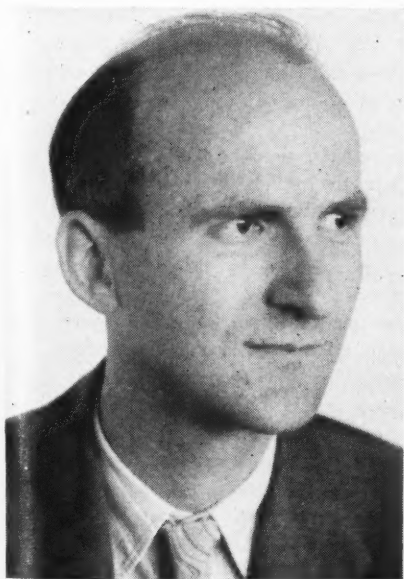
The Glidden Co. has completed a new plant in Pascagoula, Miss., to produce condensed fish solubles from "fish stick water" formerly discarded by fisheries as useless, according to a joint announcement by P. E. Sprague, vice president of the Glidden Co., and Wallace M. Quinn of Pascagoula.

The announcement described the fish solubles as a "new type of protein and vitamin bearing ingredient of outstanding nutritional value for animal and poultry rations."

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Soybeans made \$120 per acre for Henry Wells of Gregory, Ark. last year. He planted cotton three times and failed to get a stand, owing to water seepage and unfavorable weather. He abandoned efforts to get a stand, and planted soybeans, harvested them in November, and sold them to a local firm at \$3.00 per bushel.

At left, the author, Lewis B. Lockwood, at right Pei Sung King, who collaborated with him.



UTILIZATION AND CULTIVATION OF SOYBEANS *in the U. S. S. R.*



Threshing grain on a Russian farm.

By **NIKOLAI RYZHIKOV**

Head of the department of soya and castor-oil plants in the Ministry of Agriculture of the USSR.

CULTIVATION of the soybean in Russia only commenced a few score years ago. Before the Revolution this crop was only grown over small areas in the Soviet Far East. After the establishment of Soviet rule, the soybean began to be planted over larger areas.

Before the war there were large soya plantations on the collective farms of the Ukraine, Georgia and North Caucasus, while in the main soya-growing districts of the Soviet Far East the plantations increased in size four times between 1926 and 1943, and many times more in Khabarovsk territory.

The war, as we know, inflicted deep wounds on the whole of our national economy. Vast damage was caused to our agriculture, and here industrial crops, and incidentally soya, suffered greatly. The areas sown to soya in the Ukraine, North Caucasus and Moldavia decreased considerably as a result of the war and the temporary occupation. In the Ukrainian SSR these plantations decreased by 80 percent, in the North Caucasus by 82 percent and in Moldavia by 77 percent.

With the coming of peace the cultivation of industrial crops was recommenced immediately. By a decision of the Soviet government, the area sown to soya is to be increased by 52,000 hectares this year in order that next year the plantations be brought up to prewar level. In the Soviet Far East, where soya is one of the chief industrial crops grown it will cover 20 percent of the entire sown area in some districts.

The propagation of early-ripening varieties of soya is of great importance from

the point of view of advancing this crop further north. Only recently have crop breeders succeeded in combining the properties of a high crop yield and early ripening in one variety.

In the Soviet Union with its vast territory and varied climatic conditions special care is needed in choosing good varieties for each district. The varieties of soya which grow well and yield excellent crops in the North Caucasus may prove unsuitable for the Ukrainian SSR. Imported varieties, including the American, yield less in their unaccustomed environment than they did in their own country.

RUSSIAN VARIETIES

The successes of Soviet agricultural science in the spheres of selection, seed propagation and agrotechnics have helped the farm to achieve high crop yields. Tested varieties have already been selected with average ripening and yield properties, suitable for cultivation on large farms in different districts of the USSR. The varieties most widely propagated in the USSR are the "Amurskaya Zheltaya 041 and 042", "Ussuriiskaya 029", "Staroukrainskaya", "Kharkovskaya 149", "Kharbinskaya 231-a", "Kubanskaya 276" and others. All these varieties, grown in different regions of the USSR, are distinguished both by their high crop yield and rich albumen and fat content. For instance, the "Amurskaya Zheltaya 041", propagated at the Amur Selection station, is an early-ripening variety (its growing period is 107 to 109 days), has a high yield and is resistant against the soya moth. The seeds of this variety contain 20.6 percent of fat and some 41.8 percent of albumen. The lowest beans on this variety grow at a height of 12-15 cm. from the ground, which is of considerable importance in combine har-

vesting. Under the conditions of the large farms of the Soviet Union this last feature is of great importance as soya is chiefly harvested by combines, especially equipped for this purpose.

WORK DONE BY TRACTORS

Soya is sown as a rule by tractor-drawn grain seeders, and cultivation is carried out by tractor cultivators. This leaves only weeding to be done by hand. The increased crop yield is ensured by the improved methods of cultivation of the soil and the use of fertilizers.

The restoration of soya cultivation in the country is connected with the development of seed-propagation. In order to ensure that the collective farms are provided with sufficient high-grade seeds, the Council of Ministers of the USSR established that 20 percent of the actual sown areas in the collective farms be set apart for seed in 1947. By careful cultivation of these seed sections the farms improve the qualities of the seeds, thus ensuring high crop yields in the future.

The leading farms have proven that over 30 centners can be reaped per hectare. Even last year, when meteorological conditions were highly unfavorable, the May 1st Collective Farm in Khabarovsk territory grew a crop yield of 30.6 centners per hectare. (Alexandra Antonova, farmwoman who grew this crop was elected deputy to the Supreme Soviet of the RSFSR this year; she has pledged to grow 45 centners per hectare this season). A similar harvest was reported by Fekla Levshova last year.

The All-Union Research Institute of Soya and Castor-Oil Plants has carried out a great deal of work connected with the adaptation of the existing combines for soya harvesting and has introduced changes into the design of seeders used for this crop. Effective methods of combatting soya pests and diseases are being studied.

Soya has many varied uses in the national economy. Numerous food-stuffs are made with it, while its refined products are widely used in the aviation, automobile, rubber, lacquer and dyes, butter, soap and casein industries. The technology of soya refining is being improved from year to year opening up new possibilities for its application. Fodder varieties and concentrates made of waste from the soya industry are widely used by the livestock farms.

GROWTH INHIBITOR

in Soybeans

By **RAYMOND BORCHERS**

Assistant Agricultural Chemist,
Nebraska Agricultural Experiment
Station, Lincoln

The important contributions and future possibilities of soybean protein as a food for both humans and farm animals are generally recognized today. Soybean protein ranks as the number one vegetable protein concentrate both as to quantity produced and as to nutritive value of the protein. Yet, raw or improperly heated soybean protein is very poor in quality and only after adequate heating does the excellent quality of soybean protein become apparent. This remarkable improvement in the nutritive value of soybeans after heating is well known, yet the fundamental cause of this improvement has never been fully understood.

Heat treatment in itself is generally regarded as damaging to protein quality, particularly for cereal proteins. That too much heating of soybean protein is also harmful has recently been established. Although heat treatment of soybean oil meal is common in soybean processing, different lots of soybean oil meal vary considerably in nutritive value. Whether this is due to insufficient heating to bring out the full nutritive value of the meal, or to excess heating which damages the protein is not clear. Fundamental investigations into the effect of heat on soybean protein are of particular importance if a soybean oil meal of maximum and constant nutritive value is to be obtained. This is especially important in view of the primary position of soybean protein for nutrition.

TO EXPLAIN HEAT EFFECT

Many explanations have been proposed attempting to explain the effect of heat on soybeans. Several years ago, workers in the poultry department at the Nebraska Station tried extracting raw soybean oil meal with a dilute salt solution to see if a meal could be prepared that was as high in nutritive value as properly heated meal. They found that the residue or portion insoluble in dilute sodium chloride solution was equal in nutritive value to properly heated meal. But when the soluble portion was dried and added to the ration, the nutritive value of the residue plus the soluble portion was the same as that of the raw soybean meal. They concluded that the poor nutritive value of raw soybeans was due to the presence of a "toxic" or growth inhibitor factor which

could be washed out of the raw meal with a dilute salt solution as effectively as by heating. They had also shown that the growth inhibitor was still present in the extract. But if the extract was heated before mixing with the residue, then the residue plus the heated extract was equal to properly heated meal. Evidently heat is necessary during the processing of soybeans in order to destroy the growth inhibitor present in raw soybeans. Further work showed that extraction with dilute acid was equally effective in improving the soybean and that again the harmful factor or growth inhibitor was present in the soluble portion. Dilute acid has an advantage over dilute salt solution in that only about 10 percent of the protein is dissolved and removed by the acid while about 50 percent is removed by the salt solution.

NATURE OF INHIBITOR

Investigations into the nature of the growth inhibitor present in the dilute acid extract solutions showed that there was a factor in this extract which inhibited the digestive action of trypsin and erepsin, protein digesting enzymes of the intestinal tract. This led to designating the growth inhibitor as a trypsin inhibitor, although it has not been definitely established that the two factors are the same. Methods have been developed to measure the quantity of trypsin inhibitor present in soybeans. Samples of raw soybean oil meal were heated for various periods of time and the trypsin inhibitor then measured in these samples. It was found that the amount of heat treatment necessary to destroy the trypsin inhibitor was about the same as that required

● *It has been known for some time that the protein of raw or improperly heated soybeans is of poor quality. This is due to a growth inhibitor. Workers at the Nebraska Station are attacking this problem.*

to give a properly heated meal or a meal of maximum nutritive value. This may be regarded as circumstantial evidence that the trypsin inhibitor and the harmful factor or growth inhibitor present in raw soybeans are identical. Measurements of the amount of trypsin inhibitor in several lots of expeller process soybean oil meal gave various amounts of trypsin inhibitor remaining in the meal, as much as 50 percent in one sample. Whether this is related to the variable nutritive value of different lots of meal is not known.

Attempts to explain how the trypsin inhibitor acts in the body to reduce the nutritive value of the soybean have not been successful. One would expect that the trypsin inhibitor in raw soybeans would reduce the digestibility of raw soybeans as compared with heated soybeans. However, reports from several laboratories show that the digestibility of raw soybeans is little different from that of heated soybeans. Measurements of the rate of digestion of raw soybean oil meal as compared with heated meal in the body have likewise given similar results in our laboratory. Evidently the trypsin inhibitor present in raw soybeans does not affect the extent or rate of gross digestion of the soybean protein in the body.

The problem of the growth inhibitor in soybeans may be resolved into several points of attack: first, identifying fully the growth inhibitor factor in raw soybeans; second, finding how the growth inhibitor acts; third, determining the importance of the growth inhibitor in soybean oil meal marketed for feed; fourth, finding ways and means of counteracting the growth inhibitor; and fifth, developing a soybean variety which contains no growth inhibitor.

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JOINS IOWA FIRM



Clive F. Marshall left the Chicago office of Allied Mills, Inc., October 1 to join the Iowa Milling Co., Cedar Rapids, Iowa, as an officer of the company. The Iowa firm, headed by Joseph Sinaiko, is a soybean processor and formula feed manufacturer. Mr. Marshall had been in charge of soybean buying for Allied Mills for 14 years. During 1944-45 he was chief price executive of cereals, feeds, rice, seeds and fertilizers for the OPA.

LINCOLNS DO WELL IN SOUTH

By MELBA C. PATTERSON

The Lincoln soybean made a nice profit for A. M. Lawrence, farmer of near Sunflower, in Sunflower County, Miss., last year. Long diversified-minded before his neighbors had given up the idea that cotton was the only crop for Sunflower County, Mr. Lawrence started planting soybeans 10 years ago. He has tried many varieties, but using figures based on yields from loamy buckshot, with average weather conditions for the Delta, Mr. Lawrence believes he has found the most profitable bean for the Delta in the Lincoln variety.

He planted 100 acres to the Lincoln bean last year, using 2 bushels of inoculated seed per acre on land prepared in the same way he prepares his cotton land. He planted the seed broadcast, with a seed drill on the 18th day of April on loamy buckshot that had been in cotton the year before. He began harvesting on the 10th day of August, the earliest time he had ever harvested a bean crop planted at that time. This in itself is what he considers an important point in favor of the bean, as it enables the farmer to harvest his bean crop and get it out of the way before cotton picking time.

One acre of this plot planted to the bean last year, Mr. Lawrence watched very closely as it was very low, and had never yielded much in any one crop. From this acre he harvested last year 33½ bushels of Lincoln beans. Mr. Lawrence has found that the Lincoln stands up well in both extremes of weather normally experienced during a Delta crop year. It sheds very little during extreme dry heat, and can stand more water than other varieties he has planted.

Mr. Lawrence harvested 3,500 bushels from his 100 acres last year, receiving an average price of \$3.00 per bushel at the oil

A. M. Lawrence and his Lincoln soybeans.



mill. He used no fertilizer last year. This year he has doubled his acreage in the beans, planting in rows to help get rid of dock. He used only 1 bushel of seed for the crop planted in rows with a cotton planter.

By following a careful plan of crop rotation, usually following the beans with oats, Mr. Lawrence finds that he can cut down on fertilizer costs for the oats. He is convinced that the Lincoln bean is one answer to a sure crop for added cash income on Delta farms.

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NEW WEAPON AGAINST T.B. FROM SOYBEANS

Increased production of streptomycin, newest weapon against tuberculosis and other diseases, is resulting from development of a nutrient made from soybeans, it is announced by A. E. Staley Manufacturing Co., Decatur, Ill., processor of corn and soybeans.

The nutrient is consumed by streptomycin-producing mold during the course of an extremely involved manufacturing process. It combines the advantages of greater yield and lower material costs.

Monthly production of streptomycin is now about 1 million grams and as a result the government recently removed controls on its uses. Since its discovery in 1944, production has been too small to permit more than experimental use of the antibiotic until recently. Enlargement of pharmaceutical plants, availability of an adequate supply of nutrient, and improved manufacturing processes have resulted in a steady increase in production and lowering of the cost of the drug, according to Staley's.

Streptomycin has been found effective against some diseases which are resistant to penicillin, the sulfa drugs and serums. These include infections of the kidney and bladder; tularemia (rabbit fever); influenzal meningitis; certain eye infections; gram-negative peritonitis (such as from a ruptured appendix) and blood stream infections.

EFFECTIVE AGAINST LIVESTOCK DISEASES

The antibiotic has also been found effective, experimentally, against a number of serious diseases which annually inflict enormous losses on livestock and poultry producers. With the limited amount heretofore available, most of the production has been diverted to treatment of human ailments. As production increases and costs are reduced, it is expected that large quantities will be used by veterinarians.

The new soybean oil meal nutrient takes the place of complex growth-producing substances. In the early days of streptomycin culture, it was considered preferable to use

a nutrient which included a meat extract and at one time during the meat shortages early in 1946, it was feared the streptomycin program was endangered.

"There are so many variables in streptomycin production that it is not now practicable to specify even the approximate extent to which the yield is increased by the use of this nutrient," the Staley announcement said, adding "there is reason to hope the figure will ultimately prove to be in the neighborhood of 100 percent." The development was described as "one of very substantial scientific and social significance."

Possibly of equal importance to possibilities of greatly increased production is the fact that the new soybean nutrient's cost to producers is roughly one-tenth that of the protein complex materials which are the only other known suitable nutrients, Staley scientists explained. They added that there is no danger that there are not enough soybeans to produce the nutrient needed by the recently stepped-up capacity of the industry.

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OPENS FOOT CLINIC



Nadean Dunnagan has the aches removed from her feet at the South's first industrial foot clinic established by Fulton Bag & Cotton Mills at Atlanta.

Fulton Bag & Cotton Mills, largest textile mill in the Atlanta, Ga., area, has long been noted for its good labor relations. Recently the firm established the South's first industrial foot clinic.

The clinic employs a part-time foot specialist whose services are free to employees. He is available 2 hours a day, 5 days a week.

Absenteeism decreased considerably the first 4 months the clinic was operated. The company considers the \$2,000-\$3,000 spent for equipment as well invested.

Among other things sponsored by Fulton Bag for its employees are three baseball teams, a free medical and dental clinic, and a nursery where working mothers can leave their youngsters.

SOYBEANS IN NEBRASKA

By JOHN L. WEIHING¹

For many years the possibilities of soybeans have challenged the Nebraska farmer. This crop has remained quite limited in acreage in spite of its many virtues and its prominence in the more easterly Cornbelt states. Until the coming of a period of urgent industrial demand and relatively high prices, such as have prevailed since 1942, production of soybeans as a cash crop in Nebraska has not been fully warranted. Many questions arise regarding their suitability and recommended production practices in this area. In order to answer such questions, the Nebraska Agricultural Experiment Station began varietal and cultural tests at an early date, and has grown soybeans experimentally throughout the last 40 years.

CROP SKYROCKETS FOLLOWING 1941

Statistics on soybean production in Nebraska show a steady increase in total acreage from 1,782 acres in 1924 to 32,000 acres in 1941. In the following two years the crop skyrocketed to 100,000 acres. Abruptly a heavy reduction in acreage took place, with the years 1944, 1945, and 1946 having 30,000, 20,000 and 25,000 acres, respectively. Attractive increases in price and intensive publicity of the soybean in 1941 were the causes of the great upsurge in acreage for 1942-43. Prices of corn and oats caught up in the years following 1943. Difficulties were encountered by the farmers in growing a crop new to them, and they reverted quite largely to their former crops — corn, wheat, oats, and barley.

The labor cost of growing soybeans successfully in Nebraska normally exceeds that for other grain crops, especially oats and barley. Special care must be given in weed control, which involves timely and thorough seedbed preparation by plowing and supplementary harrowing and disking, followed by effective intertillage of the growing crop. The costs of planting, harvesting, and threshing are not far different from those for other crops. *

Until recent years, distance to the market has been a deterring factor in the popularity of soybeans as a cash grain crop in this state. Scattered farmers with less than carload lots have found freight costs to distant markets prohibitive. With processing plants now located in eastern Nebraska, more accessible markets are provided.

Comparative yields must be taken into consideration in the evaluation of soybeans and

other crops. Long-time statistics for Nebraska farms are not available, but in 32 years on the Experiment Station Farm at Lincoln, with recommended cultural practices, soybeans yielded an average of 15 bushels per acre, corn 33 bushels, oats 42 bushels, and winter wheat 29 bushels. These relative yields are not far from those expected under efficient production practices in eastern Nebraska. With corn and oats, respectively, yielding approximately 2.4 and 2.8 times as many bushels per acre as soybeans, the latter could not compete with them in Nebraska under formerly prevailing prices. Only when the soybean price is

2.5 times that of corn and 3.5 times that of oats do soybeans become fairly attractive in systems of diversified farming in this state.

In sections of the Cornbelt where soybeans have gained importance, the crop usually yields more in proportion to the spring small grains, which it has partly replaced, than it does in Nebraska. For example, in counties of central Illinois where concentration of soybean acreage is heaviest in that state, the yield of oats averages about 1.7 times as many bushels per acre as that of soybeans. Relatively few soybeans, however, are grown for beans in sections where yields of oats are more than twice those of soybeans.

Crop-growing conditions vary greatly in Nebraska from year to year and within the seasons in respect to such important factors as climate and the prevalence of injurious insects and plant diseases. It is

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¹Cooperative investigations between the Bureau of Plant Industry, Soils, and Agricultural Engineering and the U. S. Regional Soybean Laboratory, U. S. Department of Agriculture, Agricultural Research Administration, and the Nebraska Agricultural Experiment Station.

recognized that the greatest continuity of farm income results from growing a number of crops which give a differential response to seasonal conditions. For example, soybeans, being highly resistant to chinch bugs, may be regarded as a suitable crop to replace at least part of the barley and oat acreage where and when this insect threatens.

ARE ADAPTED IN EAST

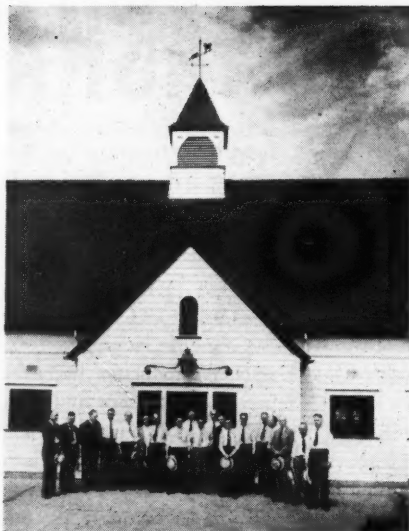
Soybeans have proved relatively well adapted to the soil and climatic conditions of eastern Nebraska. The climatic conditions of this portion of the state resemble most nearly those of prominent soybean states farther east. It is believed that with careful production practices eastern Nebraska growers may expect soybean yields that average normally two-thirds of those of Illinois. The chief limiting factor appears to be moisture deficiency. Whether this crop is to be grown on dry land farther west will depend upon further farm experience. Under favorable irrigation, yields of 20 to 30 bushels per acre should be expected. Other standard crops, of course, may respond even better to the added water.

Soybeans in Nebraska are relatively free from harmful diseases. They are, however, subject to damage from destructive insects, especially grasshoppers. Rabbits frequently destroy small isolated acreages.

In summarizing this discussion of the production of soybeans in Nebraska, it may be stated that the present average of approximately 25,000 acres will probably be maintained if the economic relation of farm crop prices remain as they are at present. Not until the yield of this crop has been increased quite markedly by plant breeding, cultural practices, or both, will the Nebraska farmer take greater interest in soybeans.

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Soybean straw that is plowed under will just about maintain the organic matter and the nitrogen content of the soil.



Group of Allied Mills sales executives in front of a large dairy barn at the new research farm at Libertyville, Ill. An auditorium for meetings is being built in one wing of the barn.

NEW RESEARCH FARM

Announcement has just been made by Allied Mills, Inc., of the purchase of a farm 3 miles south of Libertyville, Ill., for use as headquarters for its research division.

In announcing the purchase of this farm, Harold J. Buist, president of Allied Mills, pointed out that it is ideally located (35 miles from the loop in Chicago), for the extensive research activities of the corporation.

The research activities of Allied Mills have been carried on for the past 10 years at Peoria, Ill., and about 3 years ago a large farm was purchased at Chillicothe, Ill., for extension of the research work.

Allied Mills research division is headed by Dr. J. E. Hunter, director of research, who is a widely known authority on poultry and livestock nutrition. He is a member of the American Feed Manufacturers' Association Nutrition Council. The assistant director is Walter J. Rudy, who received his bio-chemistry training at Pennsylvania State College and later worked at the U.S.D.A. Research Center at Beltsville, Maryland.

DRYING OIL PROCESS BY GENERAL MILLS

As a service to the protective coating industry, the chemical division of General Mills has recently developed the details of a technique for producing a copolymer drying oil from a combination of tung and soybean oils as a replacement for heat bodied linseed oil. The reaction may be carried out in conventional types of kettle equipment in general use in the protective coating industry.

The objective of this project was to produce a copolymer of soybean and tung oils possessing properties equal or superior to those of bodied linseed oil, in which the cost of the copolymer oil would be substantially less than the cost of bodied linseed oil under present economic conditions. Patent application has already been filed to cover the art.

Laboratory tests indicate that Copolymer Oil is equal to bodied linseed oil as a chill-back oil in the production of tung oil varnishes; as the equivalent of bodied linseed oil in cold cut varnishes, oil cloth and patent leather finishes and lithographic varnishes; and as a replacement for the bodied linseed oil component of house paint.

On account of the extremely high price of linseed oil prevailing at present—occasioned by the government's support program of \$6 per bushel for flaxseed—the economic need for substitute drying oils to replace linseed oil is apparent. Because of this unusual situation, General Mills has elected to disclose the art of producing this new copolymer drying oil to the trade under a non-exclusive, no-fee agreement. The chemical division of General Mills, Inc. will handle the licensing arrangements with the trade. Information concerning the process may be obtained from the company's sales representatives located in all principal trade areas or by contacting the chemical division executive office in the General Mills Building at Minneapolis, Minn.

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FERTILIZING FOR SOYBEANS

By A. L. LANG

Associate Chief Soil Experiment Fields, Department of Agronomy, University of Illinois. Released by Soybean Crop Improvement Council

Acid soils should be limed as a first step to successful soybean culture. Other mineral deficiencies of the soil should be made up by proper fertilization. Do not guess about the fertility of your soil or your fertilizer applications. Determine them specifically by simple chemical soil tests, plant tissue tests and hunger sign observations. With the requirement of the crop for plant food known and the supplying power of the soil determined, make up the difference by fertilization. As an outgrowth from this approach and many years of experimentation, the following discussion and fertilizer program is offered.

Soybeans in their process of vegetative growth and seed production require relatively large quantities of minerals. But their inherent ability to extract these minerals from the soil's native supply makes the soybean less responsive to common fertilizer practices than most other crops. This is particularly true when the fertilizers are applied at planting time for immediate consumption. Even though the soybean does not utilize applied materials effectively the responsibility for returning the extracted minerals to the soil still remains. If this is not taken care of through good management there will be mineral exhaustion, ultimate unproductiveness and finally land abandonment.

The high mineral requirement of the soybean plant and its inherent ability to forage its nutrients beyond the range and scope of other crops tend to give it an undeserved bad reputation for being a soil depleter. But, as a matter of fact, when truly evaluated, *that inherent ability of the soybean plant to ferret out plant nutrients*

that other crops cannot reach makes it surprisingly suited to the Cornbelt cropping system. The soybean follows the corn crop as effectively and in the same manner as the porker follows the steer in the feed lot. If the steers are well fed the hogs need very little attention. Likewise, the soybean—if the corn crop is well fed the bean crop will need little or no fertilization.

The problem, then of returning plant food removed from the soil by the soybean crop becomes not one of the direct application applied for the plant itself, but rather a matter of determining the needs of the entire cropping system and making the applications to those crops which can use them most effectively.

In analyzing the needs of a typical Cornbelt rotation including corn, soybeans, small grain and legume hay for a heavily cropped level-to-rolling prairie soil many factors need to be considered. The key to high productivity on such a soil when measured in bushels of corn and soybeans is the amount of legumes that can be plowed down preceding the growing of the corn crop. The legume supplies the large quantity of nitrogen without which the corn crop cannot make maximum yields. In addition, the legume supplies organic matter which in turn gives tilth, aeration and water-holding capacity to the soil, all of which are as vital as minerals supplied through fertilization. The amount of a legume which can be grown is largely determined by the nutrient-supplying power of the soil and so the first efforts to soil improvement should be directed to and for the legume hay pasture or manuring crop. *When sufficient limestone, phosphate and potash are applied to meet the maximum requirements of the legume forage crop in the rotation, grain crops like*

(Continued on page 28)

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CROP DETERIORATES FURTHER

The soybean crop deteriorated further in September in some leading soybean producing states. Drouth conditions continued most of the month in Illinois, Arkansas and Missouri and some other states. Below normal yields are forecast in these states.

Hot, dry September weather hastened maturity over a large area of the soybean belt, but it also cut yields.

Moisture was normal in Ohio and Indiana with an above normal crop in prospect for the latter state. However, there was some damage in Indiana from late September frosts.

Considerable disease damage was reported in some areas.

There may be some tendency to store more soybeans on the farm this year than last, crop reporters say. However, this depends on the market. Farmers will sell soybeans above \$3 and tend to hold them below. A favorable price at harvest time will draw the main part of the crop to market.

Soybeans were coming into the elevators at some points as the *Digest* went to press.

Reports of *Soybean Digest* crop reporters follow, for September 28 unless otherwise specified:

ARKANSAS

Jacob Hartz, Stuttgart, for east central: Maturity about week late. Arksoys and Ral-soys ready about the middle of October. Drought will reduce yield 20-25%. We did not get a general rain until Sept. 19, too late for most varieties. 5-10% damage by corn earworms. If price at harvest is \$2.75 to \$3.00 farmers will sell at once; under \$2.50 they will store.

L. M. Humphrey, R. L. Dortch Seed Farms, Scott, for Little Rock area: (Oct. 1) Maturity about normal. 20-30% reduction in yield from excessive protracted hot weather this summer. Early beans such as Macoupin, Lincoln and others of like maturity will grade poor; later varieties good. Very small percentage in this area will be held on farms.

ILLINOIS

H. I. Cohn, Valley Farms, Carrollton, for west central: Maturity 2 weeks ahead for beans matured by drought; others will mature normally. Great difference in yield noticed on solid and rowed beans which received no rain. Rowed beans have yielded 10 bu. and up. Solid beans have hardly enough beans to pay to combine on worst fields. Some fields which received only .2 in. rain in 60 days are yielding 10-15 bu. One field received one 1½ in. rain in August, yielded 22 bu. Now combining drought-matured beans. Yields about 45-60% of 5-yr. average—10-22 bu. Fields which received some showers not ready to combine. Yields on these fields should run 18-25 bu. Un-naturally matured beans shattering badly due to low moisture content—10-11%. Grade is high, all so far Nos. 1 and 2, but beans are small as was expected. Total yield far below July prospects. All beans which can be loaded will be marketed.

Russell S. Davis, Clayton, for west central: June plantings 10 days late; July plantings still too green to tell. No killing frost

yet. Drought has cut yield more than half. June seedings harvest without difficulty but July seedings very short. Bulk of crop will go direct to market but last year's experience will probably cause a few more to be held back for seed. This will be smallest crop of soybeans this section has harvested for many years. A late, wet planting season got the crop off to poor start. No rain from June 30 to September 23 stunted growth and delayed maturity beyond recovery. We are wondering if the beans will be low in germination.

Frank S. Garwood & Sons, Stonington, for south central: Maturity 10 days-2 weeks late. Few extremely early fields now being harvested. Will probably be 2 weeks before harvesting of any consequence. Heavy frost would damage late soybeans. Drought has reduced yields considerably—are 90% normal and about same as earlier estimates. Little present indication of much disease damage. 85-90% will be harvested direct, remainder staying on the farm.

A. J. Surratt, Illinois agricultural statistician, Springfield: (Sept. 26) Maturity 2 wks. later than average. Returns from reporters indicate two-thirds safe from frost Sept. 30 compared with 7-yr. average of 82% for that date. No frost damage of consequence to date. Height of stands shorter than usual on most of early third and medium early third of acreage and largely very short or stunted on late third. State yield per acre outlook about 19 bu. compared with 23.5 bu. last year and 1936-45 average of 20.6 bu. If frost occurs before average dates is doubtful if yield will quite hold at 19 bu. September weather has in general been mild and hastened maturity of beans faster than usual. This has tended to stunt later beans, but vines fairly well podded. Rains have revived green growth of grass and weeds. This has provided other green feed for hoppers and resulted in rather light damage to beans.

J. E. Johnson, Champaign, for Champaign and adjoining counties: (Sept. 30) Maturity 10 days-2 wks. late. Some drought damage. Beans will not grade as well as average years. Yield lower than normal.

INDIANA

Peter J. Lux, State PMA, Indianapolis: Maturity 10 days late. Very little damage by frost or other conditions. Yield 6% above normal. If soybeans are \$3 per bu., 80% will be directly marketed. If under \$3, 40% will be stored on farms.

J. B. Edmondson, Danville, for south central: Maturity 1-2 wks. late. Combining will begin by Oct. 10 on May-planted upland beans. June 15 beans starting to lose leaves. Later fields still green. Beans will mature if killing frosts hold off till Oct. 15. Considerable pod and stem blight on fields that raised beans last year. Yield 100% of normal and 20% more than seemed possible earlier. Soybeans are podded more heavily than I have ever seen and growth of plant, especially on fields of lower fertility level, is highest I have seen, even on late beans. This feature is amazing to me and will boost yield.

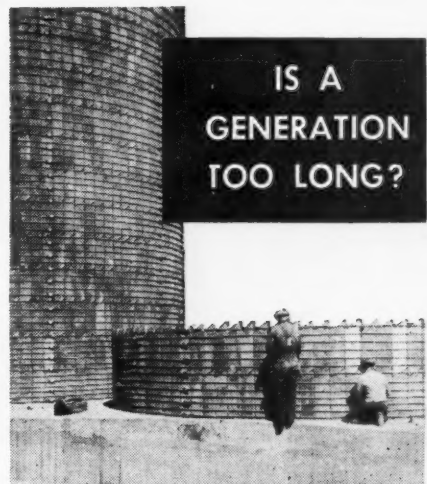
K. E. Beeson, Indiana Corn Growers Association, Lafayette: (Sept. 30) Harvest in progress in southwest. Elsewhere only Earlyanas reported harvested. Repeated frosts are damaging fields. Damage will vary from slight to serious in frosted fields.

Some disease found during September inspection.

Ersel Walley, Walley Agricultural Service, Fort Wayne, for northeast Indiana and northwest Ohio: Average maturity 3 wks. late. Yield cut some and percentage of immature beans increased by light frosts. Weather next 2 wks. will determine any further damage. Yield could be near normal if no freezing weather for 2 wks. Two-thirds crop will go to market.

IOWA

John Sand, Marcus, for northwest: Maturity 10 days late. Slight frost damage to late varieties and others planted late. Lower yields due to drought during July and August. Most beans will be of fairly good quality if combining conditions continue favor-



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able. Many farmers indicate selling from combine if prices remain above \$3.

Leslie M. Carl, state statistician, Des Moines: Maturity 8-10 days late though late-ness being made up by maturity being forced. Considerable yield loss due to disease. About 18 bu. average for state in prospect. About 25% of crop will be held on farms.

O. N. LaFollette, State Department of Agriculture, Des Moines: (Oct. 2) Maturity varying greatly over state from normal to 15 days late. Yield reduced materially by drought. Limited damage in some areas by frost. Beans will grade No. 2 or better except on frost-damaged acreage. State average per-acre yield approximately 16 bu. Percentage to be held on farms depends on market trends and possible government action.

KANSAS

E. A. Cleavinger, extension division, Kansas State College, for eastern: Yield 10-15% lower than normal and earlier estimates. Dry weather has caused many fields to ripen prematurely. Yield on these fields will be low. First fields being combined week of Sept. 21-27. 20-25% beans may be held on farm.

H. L. Collins, agricultural statistician, Topeka: (Sept. 26) Hot, dry weather during September hastened maturity of large acreage of late beans. Yields have been somewhat reduced but quality good. Grasshoppers in many fields. Quality okay. 85% of crop will be marketed direct.

KENTUCKY

H. F. Bryant, state statistician, Louisville: (Sept. 26) Some soybeans 1-2 wks. late, most

about normal. Indicated yield about normal. Sept. 1 estimate 18 bu. per acre, same as last year.

MINNESOTA

John W. Evans, Montevideo, for south-west central: Crop 85-90% mature. Harvesting prospects excellent. Many fields defoliated themselves 2 wks. ago from advanced maturity. Killing frosts stopped development of beans but not all leaves killed. Yield 90% normal. Some beans being combined and showing 11-12% moisture. 75% marketed direct.

R. E. Hodgson, Waseca, for south central: Frost has killed all leaves. Most fields seem fairly well matured. Harvesting will commence as soon as beans are dry enough. Low spots and potholes were damaged by excessive moisture last spring. Sandy knolls were hurt by drought but prospects look normal. My guess is yield will be about normal or a little less. 50% crop may go to market at once. If prices look weak, more may go.

MISSOURI

E. M. Poirot, Golden City, for southwest: (Sept. 26) Maturity about normal. Harvesting prospects good. Drought serious, yield 40% below normal. 90% will be marketed direct.

Harry A. Plattner, Malta Bend: Maturity late. Early beans damaged by dry weather in midsummer. Caused green and shriveled beans. Quality poor. Yield 20% below normal. 75% will be marketed direct.

NORTH CAROLINA

Frank Parks, agricultural statistician, Raleigh: (Oct. 1) Maturity late due to continued growing weather. Late Sept. cool conditions will change this, however. Disease damage about average. Insect damage above average. Yield some above average.

NORTH DAKOTA

C. J. Heltemes, state statistician, Fargo: Soybeans have matured satisfactorily but due to dry weather in July and August there are only 2 to 3 beans in a pod and a little smaller than usual. Harvesting is in full swing, weather permitting and is approaching the windup.

OHIO

D. F. Beard, extension agronomist Ohio State University, Columbus: Maturity slightly later than normal but ahead of last year. Just starting to harvest earliest maturing fields. Few late fields killed by frost. Probably wouldn't have produced much anyway. Yield about normal, higher than earlier estimates.

W. G. Weigle, manager Marsh Foundation Farms, Van Wert, for northwest: (Sept. 26) In spite of late planting maturity now only 2 weeks behind normal. Even a few fields soon due to combine. There was a higher percentage of early beans planted this year than normal for this section. Only about 20% of fields still in danger of frost damage. Some grasshopper damage. Yields likely to be below normal due to poor stands and weedy fields. Most farmers will find some place on the farm to store their beans unless market is \$3 or better. Many beans will be held regardless of price.

David G. Wing, Mechanicsburg, for west central: Maturity 2 wks. later than normal. Frost this week killed all top leaves and remains to be seen how much damage has been done. A few fields will be ready for harvest in 10 days. Yield has been cut 10-20% by late planting and frost. Hot dry weather during October may dry up frosted beans into fairly good beans. 90% will go

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direct to market. Our late planted beans looked good until frost this week.

ONTARIO

R. H. Peck, River Canard, Ontario, for southwest: Most beans about 10 days later than usual. In most fields some leaves just beginning to fall, with odd field of earlier varieties rather well advanced. Slight damage from frost Sept. 25. Some sections had yield cut by dry weather early in summer. Very little disease this year. Yield almost normal as beans have done very well in September. Essex, Kent, Elgin, Lambton and Middlesex counties have a soybean acreage of about 60,000 this year, with estimated yield set at 18 bu.

SOUTH DAKOTA

H. C. Miller & Son, Garden City, S. D., for Clark County: Maturity about normal, except for few very late fields caught with frost around Sept. 22. Harvesting will probably start around Oct. 12. Height of plants considerably shorter this year due to long drought. Yield will be affected 10-20% for lack of moisture during latter part of growing season. Estimated yield per acre 10-12 bu. 80% of crop will probably go direct to market.

VIRGINIA

H. W. Taylor, Department of Agriculture, Richmond: Recent rains will prolong growing period so maturity later than normal by 10%. Some crop in eastern counties damaged by August and early Sept. drought.

WEST VIRGINIA

R. J. Friant and Collins Veatch, College of Agriculture, Morgantown: Maturity 2-3 wks. late. Some frost damage to hay. Yield average. 95% will be held on farm for hay.

— s b d —

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946.

Of The Soybean Digest, published monthly at Hudson, Iowa, for September 30, 1947.
State of Iowa

County of Black Hawk

ss.

Before me, a notary public in and for the State and county aforesaid, personally appeared Geo. M. Strayer, who, having been

duly sworn according to law, deposes and says that he is the editor of *The Soybean Digest* and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in above caption, required by the act of August 24, 1912, as amended by the acts of March 3, 1933, and July 2, 1946 (section 537, Postal Laws and Regulations), to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher: American Soybean Association, Hudson, Iowa.

Editor: Geo. M. Strayer, Hudson, Iowa.
Managing editor: Kent Pellett, Hudson, Iowa.

Business manager: George McCulley, Hudson, Iowa.

2. That the owner is: American Soybean Association, Hudson, Iowa.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

GEO. M. STRAYER,

Editor.

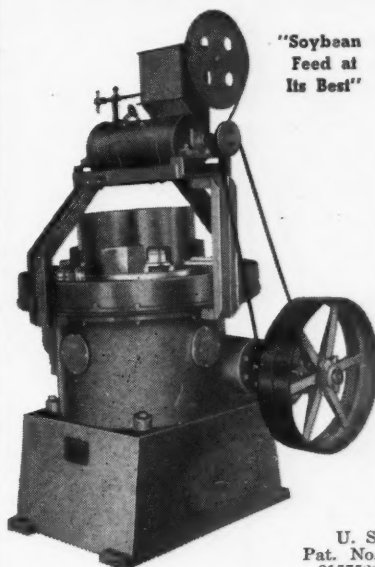
Sworn to and subscribed before me this 30th day of September, 1947.

SEAL GEORGE McCULLEY,
(My commission expires July 4, 1948.)

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GRITS and FLAKES...

FROM THE WORLD OF SOY

Floyd M. Barnes, vice president in charge of purchases for the Procter & Gamble Co., retired from active service September 1. He was succeeded by Harvey C. Knowles who was vice president in charge of manufacture. Knowles was succeeded by Dr. James G. Pleasants as director of manufacture.

* * * *

Howard Boeke, Boeke Feed, Des Moines, was elected president of the Feed Institute, Inc. (Iowa) at the annual meeting September 9 in Des Moines. Raymond Fleck, Fleck Elevator, Killduff, was elected vice president; and Carroll Swanson, Swanson Sales Co., Des Moines, secretary-treasurer.

* * * *

Mount & Alsop, Inc., with offices in Portland, Ore., has been appointed sales representative for General Mills, Inc., chemical division in Oregon and Washington. The firm will handle General Mills' complete line of fats and oils as well as organic chemical derivatives for the technical trade.

* * * *

The Illinois Farm Supply Co., a subsidiary of the Illinois Agricultural Association, has now produced 3 million gallons of Soyoil paint. This paint was developed by the firm and University of Illinois chemists to open up a bigger market for Illinois soybeans.

* * * *

Dearborn Motors Corp., Detroit, has purchased Wood Bros., Inc., 60-year-old farm equipment manufacturing concern in Des Moines, Iowa. Frank R. Pierce, president of Dearborn Motors, said that the Des Moines firm will continue production of cornpickers and will manufacture combines as soon as materials are available.

* * * *

"Soybean Mill Has Faith in Kansas," is an account of the Archer-Daniels-Midland Co. operations at Fredonia, Kans., in *Kansas Business Magazine* for August. A-D-M has been expanding and modernizing its Fredonia mill the past year, now has storage capacity for 900,000 bushels.

* * * *

Directors of the Boone Valley Cooperative Association, Eagle Grove, Iowa, have voted to build a larger soybean processing plant than the one which was destroyed by fire of undetermined origin August 23. Work on the new plant will get under way as soon as men and materials are available.

* * * *

Construction of the Tri-States Refining Co., Wilson, Ark., was completed and operations started September 1. Plant will refine both cottonseed and soybean oil from the Delta Products Co. and the Wilson Soybean Mill at Wilson. C. W. Hoover is general manager of the three plants.

* * * *

The soya noodles package of the Standard Dietetic Food Co., Chicago, has been re-designed. Sales appeal is enhanced by the use of blue and yellow colors.

* * * *

Dannen Grain & Milling Co. was high bidder in the auction of the Soya Products Co. operating equipment at St. Joseph, Mo., August 28. Sale price of the lot was \$26,000.

* * * *

Falk & Co., Pittsburgh, has become associated with Cargill, Inc., Minneapolis, and will distribute all of Cargill's linseed oils. Falk also handles fish and soybean oils and alkyl resins.

TO MINNEAPOLIS

D. J. Bunnell has resigned from Central Soya Co., Inc., Chicago. He became president and general manager of the Northwest Linseed Co., Minneapolis October 1.

Mr. Bunnell had been with Central Soya since 1937, as vice president and director in charge of the company's soybean buying and sales of oil. He was chairman of the executive committee and director of the National Soybean Processors Association the past 2 years. He was also a director of the American Feed Manufacturers Association until his resignation in September.

Formerly he had been with Crawfordsville Seed Co., Crawfordsville, Ind.; and later, in charge of the seed department for Allied Mills, Inc.

D. J. BUNNELL



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TO VICTORY MILLS



F. H. LEHBERG

F. H. Lehberg, oils and fats administrator, the Wartime Prices and Trade Board of the Canadian Dominion government, has been appointed vice president in charge of trade development of Victory Mills, Ltd., Toronto.

For the time being Mr. Lehberg will continue his duties as fats and oils administrator, spending part of his time in Ottawa.

Lehberg joined the Dominion government service in 1928, conducting research in fats and oils, particularly in the development of oil-bearing crops in Western Canada, and the industrial utilization of farm products. From its inception until 1942, he was secretary, Committee on Oilseeds, Associate Committee on Grain Research, National Research Council and Dominion Department of Agriculture. He is the author of numerous papers in the field of fats and oils.

In February, 1942, Lehberg joined the Wartime Prices and Trade Board as technical adviser, Oils and Fats Administration and, successively, deputy administrator and administrator of that division of the Board.

Lehberg is the Canadian member of the committee on fats, oils and feeds, International Emergency Food Council (formerly Combined Food Board) and alternate member, committee on vitamins, Combined Food Board.

— s b d —

FREIGHT RATES RISE

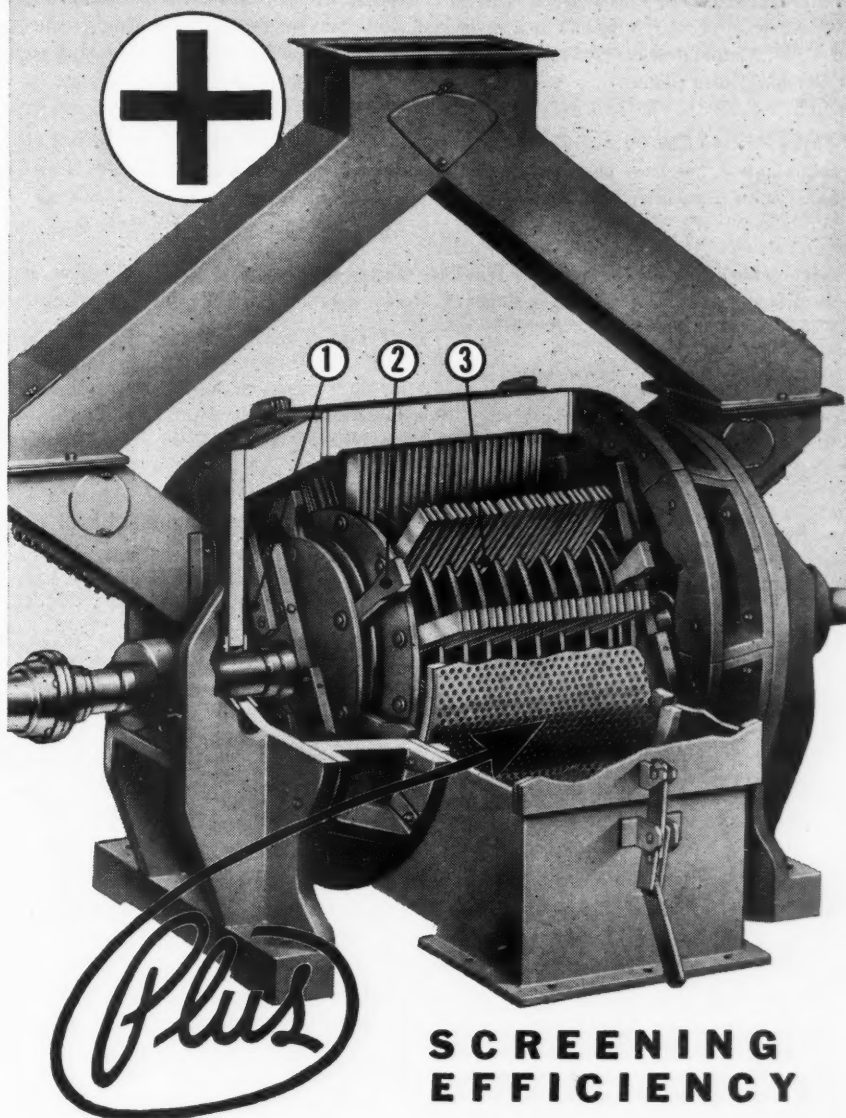
Effective October 1, all soybean oil meal rates to west coast terminal points were advanced from the present basis of 72 cents from Decatur, Ill., to 87½ cents, or a net advance of \$3.19 a ton, calculating the transportation tax.

The announcement of the increase came in supplement 21 to Transcontinental Freight Bureau Tariff 45-F.

The basis for the preferential rate to coast terminal points is eliminated. Soybean oil meal and other commodities are placed on a rate group basis.

OCTOBER, 1947

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Bar-Nun Sifters is title of a new 12-page illustrated catalog put out by the B. F. Gump Co., 431-437 S. Clinton St., Chicago 7. The catalog describes the line of sifters manufactured by the company, and is available to anyone who will write in for it.

* * * *

Recent changes by Link-Belt Co., Chicago: James B. Elliott is now division sales manager at Minneapolis; Erwin A. Wendell, is divisional sales manager for Caldwell plant products; and T. W. Matchett is district sales manager for the Chicago branch with headquarters at the Pershing Road plant.

* * * *

Miss Modane Marchbanks, Atlanta, Ga., until recently executive director of the National Peanut Council, has been named head of the consumer service department of the National Association of Margarine Manufacturers, with offices in Chicago.

* * * *

Janesville Mills, Inc., Janesville, Wis., has started production of poultry and livestock concentrates, according to Manager Roger A. Hook. Previously the firm had manufactured only soybean oil meal.

* * * *

Wilco Sales Co., 49 Union Ave., Memphis, Tenn., is a new brokerage firm with A. R. Shearon in charge. The firm will handle all soybean and cottonseed products for the Lee Wilson & Co., Wilson, Ark., interests, including the Wilson Soybean Mill, Delta Products Co., and Lee Wilson & Co.

* * * *

The appointment of R. J. Stevens to the post of sales manager of Chase Bag Co.'s Buffalo branch has been announced. Mr. Stevens has been sales representative of Chase at Buffalo for 3 years.

* * * *

M. Vincent Fisher has been appointed district sales representative of Sprout, Waldron & Co., Muncy, Pa., for its northern Indiana, northern Ohio and Michigan territory. He will be stationed in Toledo, Ohio.

* * * *

Geo. W. Porter, associated with a leading patent law firm in Washington, D. C., for 10 years, has joined Pillsbury Mills, Inc., Minneapolis, as a patent and trademark attorney effective October 1.

* * * *

Facts on Soyco have been gathered in a leaflet for candy manufacturers by the Whitson Products division of the Borden Co. Soyco's use as a whipping agent is described and a number of formulas are suggested.

* * * *

Membership in the foreign trade advisory committee under the Research and Marketing Act of 1946 includes: Allan Kline, president Iowa Farm Bureau Federation, Des Moines; Ed Grimes, Cargill, Inc., Minneapolis; and Vic Acker, Spencer Kellogg & Sons, Inc., Buffalo.

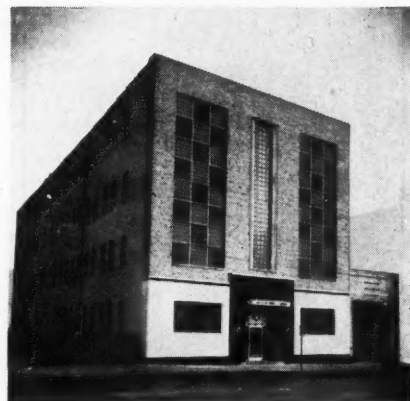
* * * *

A contract for construction of a plant at Vancouver, Wash., for manufacture of multiwall paper shipping sacks has been announced by Bemis Bro. Bag Co., at Seattle.

* * * *

West Memphis Cotton Oil Mill, West Memphis, Ark., has broken ground to install two French screw-type expellers to crush soybeans this season.

NEW LABORATORY



New laboratory of the Purina Co.

Consolidation of all research laboratory facilities by the Ralston Purina Co., in a new modern 4-story building, which provides approximately 30,000 square feet of floor space, has been announced by Donald Danforth, president.

The building includes 35 individual laboratory units engaged in research in human foods, animal feeds, sanitation products, agricultural chemicals, and farm supplies.

In addition to analytical, organic, and inorganic laboratories, the building includes modern cereal laboratories and complete biological units with capacities for 12,000 chicks and poults, 50 dogs, and 500 rats. These units are used for basic research in the fundamental nutritional requirements of animals and for investigations on new theories and ingredients which may become integral parts of the company's products.

In announcing the opening of the new building to visitors, Danforth says that it is dedicated to continued research as an essential part of the feed industry's obligation to the American farmer—to insure that the products he buys will produce more meat, milk and eggs.

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Publications

Feeding

SOYBEAN OIL MEAL FOR PIGS. By W. L. Robison, *Farm and Home Research*, May-June 1947. Ohio Agricultural Experiment Station, Wooster.

A report on extensive experiments with soybean oil meal in pig feeding.

On good pasture, with added minerals in the ration, soybean oil meal was as effective as 60 percent protein meat scraps; and a single protein concentrate was as effective as mixtures of two or more protein concentrates for pigs.

But for pigs in dry lot, a yellow corn, soybean oil meal and mineral ration containing 4 to 5 percent of ground, good-quality alfalfa was deficient in one or more respects. The ration was not improved by synthetic methionine. Another grain—oats—or another concentrate—a mixture of linseed and cottonseed meal—benefited the ration but did not overcome the deficiency.

The following products added to the above ration did result in normal growth and greater gains: 10 to 12 percent of high quality alfalfa, yeast grown in wet feed, dried brewers' yeast, condensed fish solubles, dried distillers' solubles, fish meal or meat scraps.

Any of the above products may be used to improve a ration of corn, soybean oil meal, ground alfalfa and minerals for pigs in dry lot.

Margarine

BUTTER VS. MARGARINE. By Hubert A. Kenny. *American Mercury*, August 1947.

But for the state and federal anti-margarine laws, the product would now be in plentiful supply, the author says.

"For 60 years, federal and state legislation has hampered the sale of margarine so that it has never come close to equalling the popularity of butter, and in the years before the war the demand for margarine was small," he reasons.

"Without restrictive legislation, the demand for margarine would have been far greater. In consequence, the demand for cottonseed and soybean oil would have been greater, their prices higher, and far more soybeans, especially, would have been grown. Instead of today's shortage, we could have had a surplus—a surplus to share with a world in distress."

The author gives considerable background in this article on the butter-margarine controversy, which he believes will be eventually resolved in favor of margarine. "Sooner or later, at the public's insistence, Congress will write laws for tax-free yellow margarine," he says.

Foods

A NUTRITIONAL STUDY OF THE FORTIFICATION OF GRAHAM-TYPE CRACKERS WITH SOY GRITS, CALCIUM AND SEVERAL VITAMINS. By S. C. Carlson, E. C. Herrmann, R. M. Bohn and J. W. Hayward. *Cereal Chemistry*, May 1947.

Graham-type crackers, fortified with soy grits, have nutritional qualities markedly superior to those of regular graham crackers. Nutritional effect of fortifying graham crackers by the substitution of 30 percent soy grits for the graham flour, and by the addition of calcium, riboflavin, niacin, carotene and vitamin D was studied.

The studies indicate that regular graham crackers are deficient primarily in protein.

LECITHIN INCREASES FAT DIGESTIBILITY. *Food Materials and Equipment*, June 1947.

From the University of Southern California School of Medicine comes the report of Augur, Rollman and Denel that the addition of lecithin to cottonseed oil or to a hydrogenated cottonseed oil greatly lowered the susceptibility to diarrhea caused by feeding the fat in large doses.

When the fats contained one-sixth to one-fifth of crude lecithin they were absorbed much more rapidly than those without added phosphatide.

Recent Publications

BABES IN SOYLAND. By C. Roy Adair. *Southern Seedsman*, August 1947.

An account of the soybean breeding work of the state agricultural experiment stations and the U. S. Regional Soybean Laboratory in the South; and a description of the new varieties for the region.

DELTA-TOCOPHEROL. I. ISOLATION FROM SOYBEAN OIL AND PROPERTIES. By Max H. Stern, Charles D. Robeson, Leonard Weisler and James G. Baxter. *Journal of the American Chemical Society*, 69, 869 (1947).

A newly recognized tocopherol has been isolated from soybean oil. Certain of its properties are described.

THE WONDER BEAN. A. E. Staley Mfg. Co., Decatur, Ill. 32 page booklet, illustrated and in color, issued by Staley in commemoration of the firm's 25th anniversary as a soybean processor.

PROFITABLE SOYBEAN YIELDS. By E. R. Collins, W. L. Nelson and E. E. Hartwig. Extension Circular No. 295. North Carolina State College, State College Station.

Five steps for profitable soybean yields

in North Carolina. Ogden and Roanoke are the recommended varieties.

DEFICIENCIES IN OVER-HEATED SOYBEAN OIL MEAL. By D. R. Clandinin, W. W. Cravens, C. A. Elvehjem and J. G. Halpin. *Poultry Science*, March 1947.

A study of over-heated soybean oil meal, which is deficient in certain vitamins and amino acids.

WARTIME PROBLEMS IN HANDLING SOYBEANS. By L. J. Norton. *American Cooperator*.

A history of the wartime expansion of the soybean crop, and the relationship of the soybean industry with the Commodity Credit Corporation.

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WASHINGTON Digest

U. S. Food Program

The cabinet committee's report on the food situation issued in late September gave the impression that a schedule of exports was being set up which would increase fats and oils exports for the year ending next June 30 by 50 percent over last year.

Actually, this is not necessarily the case.

The cabinet committee's schedule of exports is merely a statement of availability.

It is an estimate of the total volume of fats and oils which might be available for export during the year, providing:

1. Dollar-short countries can scrape up the financing.
2. Congress increases appropriations for direct food relief and the Army.
3. The commodities can be obtained for what the Administration considers a "reasonable" price.

The potential export supplies of edible fats and oils and peanuts was expressed in terms of trillions of calories and in dollar value at current prices.

The total set out tentatively for edible fats and oils and peanuts came to \$153,900,000, representing 7.1 percent of the available food exports for the year.

The Department of Agriculture which prepared these estimates is withholding any breakdown of the potential exports by commodities. However, it is learned that the biggest increases are planned, as of now, in lard, soybean oil, and shelled peanuts.

Cost of the product will play an important part in determining the actual volume shipped. The cost of fats and oils falls into the relatively low-bracket, and thus comes at present prices within the group of "low-cost" foods which are in great export demand.

In recent weeks the export program has run into inflation troubles. On at least two occasions, one involving lard the other soy-

bean oil, USDA buyers have been unable to obtain the desired quantities on a bid and acceptance basis because suppliers have held for possible higher prices.

Just how much any edging up of prices will affect actual fats and oils shipments and buying policy won't be known until the Administration definitely makes up its mind which way it will go, and until the question of new funds is settled.

The pressures are building up strong for controls on the domestic use of grains, both from within the Administration and from Republican leaders in Congress.

The announced program of total food exports "available" for the current year comes to a total of 17 million tons, 1½ million tons lower than last year.

The export program actually agreed on, if possible, by USDA, State Department and the Army, comes to a total of 19½ million tons, a million more than last year.

Whether the total program will be realized depends upon success of a voluntary food-saving campaign, the action of Congress in granting new funds and approving or disapproving controls, and the behavior of prices.

Despite the apparent emphasis on "non-grain" foods in the cabinet committee report, the real drive will be to export 570 million bushels of grain—500 million wheat and 70 million other grains, or a total of about 15 million tons.

As the grain export program succeeds, there will be somewhat less emphasis on non-grain foods, and less willingness on the part of government buyers to take other commodities at any price.

On the other hand, the big drive to obtain wheat for export is almost certain to result in a market squeeze next spring which will boost prices and have indirect price effects on the non-grain commodities.

The drive for more food exports is much more intense, and has a wider basis of sup-

By PORTER M. HEDGE

Washington Correspondent for
The Soybean Digest

port within all government circles, this year than it was in the winter and spring of 1946 when the old famine emergency committee was organized.

The State Department is determined to have a volume of exports at least as big as last year. The Army is much more deeply involved this time than it was 2 years ago.

Despite some criticism of the large volume of exports at a time of high prices, congressmen who have returned from Europe paint a black picture of conditions there. There is a great deal of evidence that support for large exports will build up, after all the touring congressmen get back.

Except in a general way, the Administration doesn't have specific and detailed plans for moving the food program ahead.

President Truman is putting on the new citizens food committee the responsibility of making recommendations on the entire food front.

As of this writing, it seems probable that controls on the domestic use of grains will be voted by Congress when it returns—over the opposition of USDA. If so, this would involve protein feeds as well as other feeds.

A return of price controls and rationing—or a freeze of prices and wages—appears very remote, barring crop failures next year.

Supply of Meal

Department of Agriculture is estimating a supply of 3,350,000 tons of soybean oil meal will be available during the 1947-48 year, compared with 3,750,000 tons last year.

However, the estimated supply of all high protein meals is up 240,000 tons above the total for last year. The increase is due

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mainly to a sharp rise in the expected output of cottonseed meal.

Here are the current USDA estimates of protein meal supplies for the coming year, in terms of 1,000 tons, compared with 1946-47:

(1,000 Tons)		
Commodity	1946-47	1947-48
Soybean	3,750	3,350
Cottonseed	1,400	1,875
Flax	375	650
Peanut	100	100
Copra	175	225
Total oilseed cake & meal	5,800	6,200
Corn gluten feed & meal....	1,000	900
Distillers dried grain.....	215	200
Brewers dried grain.....	500	450
Total other vegetable proteins	1,715	1,550
Tankage & meat scrap.....	725	725
Mfg. dried milk products....	85	90
Dry equivalent of milk fed on farms	1,460	1,450
Fish meal	175	185
Total animal & marine proteins	2,445	2,450
Grand total all proteins.....	9,960	10,200

Fats and Oils Allocations

The 4th quarter allocation of fats and oils for export totals 452,500,000 pounds, more than double last year's total for the same period of 176,000,000 pounds.

Of the total, 331,700,000 pounds will be handled commercially, and the remainder by Production and Marketing Administration. Here is the breakdown of the commercial quotas:

Lard 74.6 million pounds, margarine 5.2 million pounds, shortening and other edible oils 100.2 million pounds; drying oils 15.5 million pounds, other inedible fats and oils 33.1 million pounds, soap 17.1 million pounds, and peanuts 86 million pounds in terms of oil equivalent.

Oils for Export

Department of Agriculture is reported to have estimated a 250 million-pound supply of edible oils, mostly soybean and cottonseed, "available" for export during the year ending June 30.

This compares with 131 million pounds for last year.

The 250 million pounds is said to constitute the "availability" reported by Secretary Anderson in the Cabinet Food Committee report last month.

Whether this amount actually will be exported or not depends on prices, congressional appropriations for food relief, and the outcome of financial aid programs for Europe.

The lard "availability" is said to be 350 million pounds for this year, compared with exports of 313 million last year.

Herrmann to Research

Omer W. Herrmann, former head of the fats and oils branch of Production and Marketing Administration, has resigned this post to become an assistant administrator of the Agricultural Research Administration.

Herrmann's job will be to coordinate research on utilization and marketing under the Hope-Flannagan marketing and research act with the regular research activities of the Department of Agriculture.

Price Support

USDA's Fats & Oils Branch is recommending the same price support for soybeans next year—\$2.04 a bushel. At press time, next year's soybean acreage goal hadn't been decided, but it probably will be close to this year's acreage of about 10.7 million for harvest.

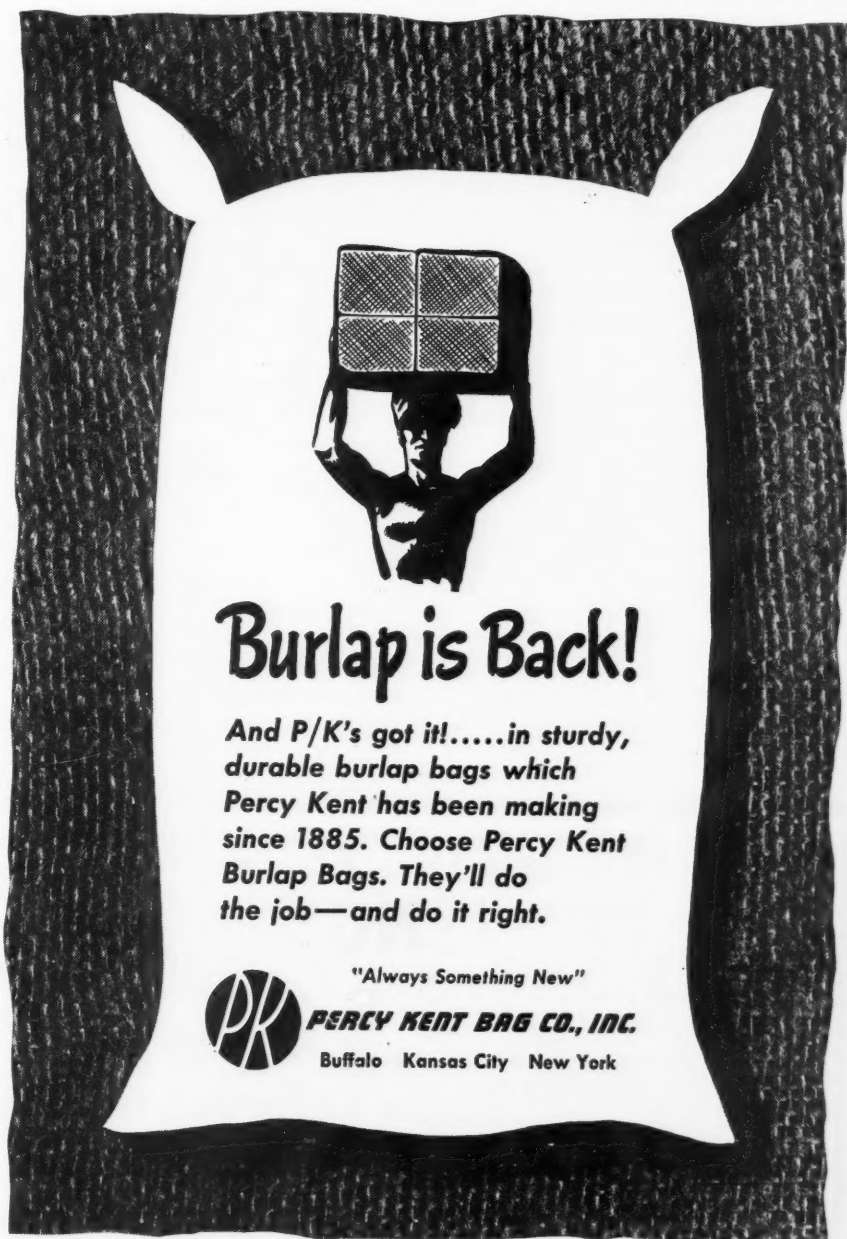
WE BEG PARDON

Two errors occurred in announcement of American Soybean Association committees in the September issue, for which we crave your indulgence.

The executive committee of the Association as it should have been published is: President Ersel Walley, Fort Wayne, Ind.; Vice President W. G. Weigle, Van Wert, Ohio; Secretary-Treasurer Geo. M. Strayer, Hudson, Iowa; Howard L. Roach, Plainfield, Iowa; and Walter W. McLaughlin, Decatur, Ill.

The awards committee is: Weigle; J. B. Edmondson, Danville, Ind.; J. W. Calland, Central Soya Co., Inc., Decatur, Ind.; Dr. W. J. Morse, Beltsville, Md.; and J. C. Hackleman, Urbana, Ill.

Strayer's name was omitted from the executive committee and Hackleman's name was omitted from the awards committee.



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SAYS SOYBEAN CROP TO HOLD WAR GAINS

The U. S. soybean crop may be expected to hold most of its wartime gains in acreage and production if conditions remain generally prosperous, by 1955, reports Peter L. Hansen, in the *Agricultural Situation* for August of the U. S. Department of Agriculture.

"Under conditions of general prosperity, neither the world situation in 1955 nor the domestic outlook for fats and oils would call for any drastic return to prewar production levels for our oil crops," he says.

"Soybeans, now our largest oil crop, would hold most of its war-gained expansion in 1955. The increase in production of soybeans together with other factors, has helped soybean oil and meal to gain wider acceptance.

"Recent technological advances may make soybean oil more adaptable for use in the drying industries, suggesting a possible expansion in its use for drying. Also, we may be able to export large quantities of soybean oil to northern Europe. This will depend on a number of factors, including the status of the crop in Manchuria.

"Even though the outlook is promising, our own soybean production will probably shrink moderately. This would be needed to protect our soil from erosion and depletion. Adjustment of our soybean acreage to conservation requirements would cut our crop down to 160 or 170 million bushels. In recent years our crop has been over 190 million bushels a year."

—s b d—

NEW HIGH FOR FATS

Domestic production of fats and oils in 1947 will reach the highest level in peacetime history at about 9,500,000,000 pounds, the Department of Commerce has estimated.

If weather conditions are favorable this Fall in the growing and harvest season of various oilseed crops, the record output may run 400 million pounds above the forecast, the survey stated.

A 1947-48 crop year production of 9 billion, 900 million pounds would mean some

10 billion pounds available for domestic use, assuming that net imports reach 100 million in line with current trends. Supplies at this level, with no increase in stocks, would provide a per capita consumption of 70 pounds in the 1947-48 crop year, compared with a peak of 82 pounds in 1941, the 1937-41 average of 73.5 pounds and an estimated 68 pounds for 1947.

—s b d—

OIL CHEMISTS' MEETING

A total of 36 technical papers will be presented at the 21st fall meeting of the American Oil Chemists' Society on October 20-22 at the Edgewater Beach Hotel, Chicago.

They are divided into four symposia: soap and glycerine; drying oils, reversion, stability, oxidation, and antioxidants; and processing methods.

In addition, there will be general papers on fats and oils. G. A. Crapple of Wilson and Co., Chicago, is chairman; and H. C. Black of Swift and Co., Chicago, program chairman.

R. T. Milner of Peoria will preside.

—s b d—

LANG

(Continued from page 8)

corn and soybeans will be amply cared for, providing enough of the forage crop is returned to the land in either green or animal manures.

For the average Cornbelt soil this means 2 to 4 tons of ground limestone every 8 to 10 years; for most soils it also means 1,000 to 1,500 pounds of finely ground rock phosphate every 8 to 12 years or its equivalent in superphosphate, 500 to 800 pounds an acre each rotation. Where potassium is shown to be deficient by test, then 200 to 400 pounds of potassium chloride per rotation will do the job either all applied for the clover or divided between the clover and grain crops.

This outlined fertilizer program for soybeans has been proved to be effective by more than 30 years of results from the many permanently established outlying soil experiment fields in Illinois. It is simply and easily put into practice by owner and tenant operators alike.

Market Street

We invite the readers of THE SOYBEAN DIGEST to use "MARKET STREET" for their classified advertising. If you have processing machinery, laboratory equipment, soybean seed, or other items of interest to the industry, advertise them here.

Rate: 5c per word per issue.
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WANTED — Experienced man to take charge of development of soybean production program on extensive acreage in New Zealand. Must choose varieties, supervise production, supervise mechanization, handle entire project up to delivery of crop to mill. Will provide air travel, expenses and remuneration to right man to look over job before accepting. Write PC, care of Soybean Digest, Hudson, Iowa, giving qualifications, experience, salary expected and date available.

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In The MARKETS

SHARP ADVANCES IN BEANS, OIL AND OIL MEAL IN SEPTEMBER

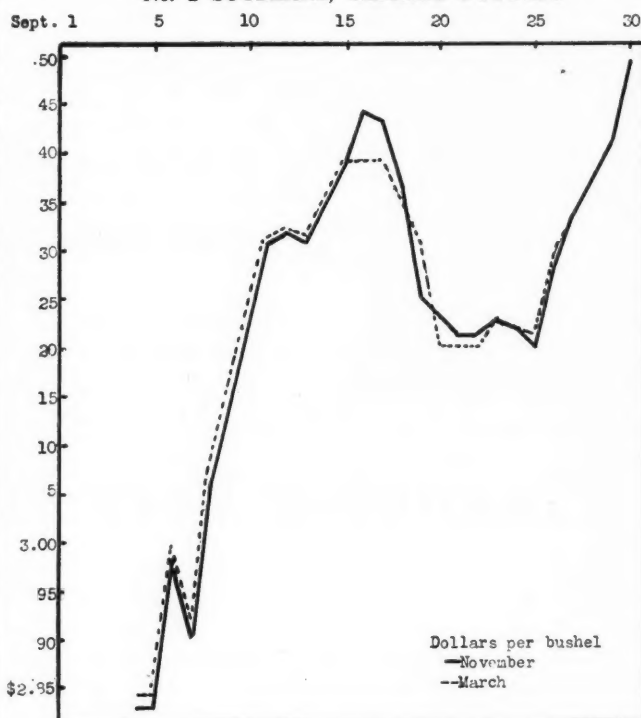
There were strong advances in soybean, oil and oil meal markets in September as these items followed other farm commodities skyward.

November soybeans reached a new high of \$3.50 since the establishment of the Chicago futures market in July. Spot soybean oil meal sold at \$107 bulk basis Decatur, the highest point since the removal of ceilings in October 1946.

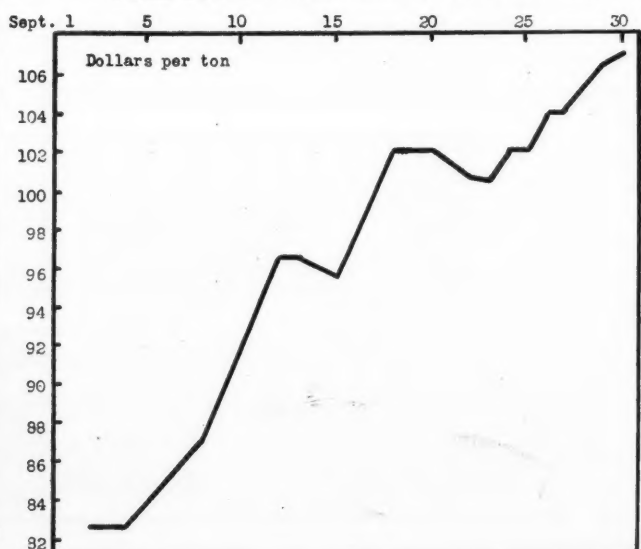
Soybean oil, following the upward trend of lard and other oils, more than regained ground lost in August, bringing 22c per pound, the highest price since May.

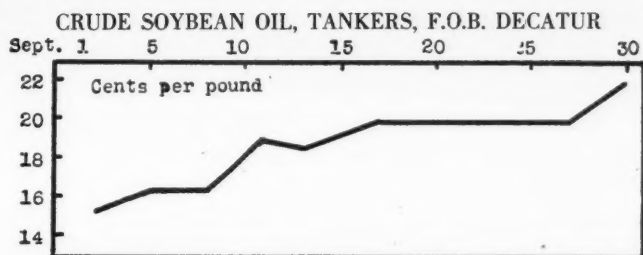
Factors in the increase were the poorer corn and soybean crop prospects shown by the U. S. Department of Agriculture's September 1 crop report, and the apparent necessity of large food shipments

No. 2 SOYBEANS, CHICAGO FUTURES



BULK SOYBEAN OIL MEAL DECATUR BASIS





abroad. Announcement of the government's fourth quarter oil allocation, two and one-half times that of the same period last year, strengthened the oil markets.

But actual activity in the markets was not heavy. Soybean processing has largely ceased pending arrival of the new crop on the market. Few cars of beans were received on the Chicago market in September. There was good demand for the limited offerings.

November soybeans reached a high of \$3.50 September 30, from a low point of \$2.83½ September 4. There was a break in the market during the third week but prices resumed their upward trend during the last week of the month.

The advance in the soybean oil meal market began September 5 after holding at a price of from \$74 to \$80 a ton bulk meal, basis Decatur for almost 2 months. The rise was about \$28 a ton to \$107 September 30. By the end of the month oil meal had worked into a more nearly normal price relationship with corn, as it was selling at a higher price than corn on a ton basis.

Crude soybean oil began the month at 15½c, in tankers, f.o.b. Decatur. By September 16 it had advanced to 20c where it remained until the last two days of the month, when it pushed up to 22c.

SOYBEAN MEAL FUTURES MEMPHIS—SEPT. 30*

Contract—100 Tons	
Decatur—Sacked Basis	
close	
October	†\$95.00
December	†\$85.00
January, 1948	82.75@83.25
March, 1948	†\$82.25
May, 1948	†\$81.00
July, 1948	79.25@81.50

Sales, 2,000. † Bid. ‡ Flat.

*Reported by the Chicago Journal of Commerce.

N. Y. SOYBEAN OIL FUTURES, SEPT. 30*

	close	pr. cl.
October	22.50	21.50
December	22.50	21.50
January, 1948	22.50	21.50
March, 1948	22.00	21.75
May, 1948	22.50	21.50
July, 1948	22.50	21.50
September, 1948	22.50	21.50
Total sales, none.		

• **COMMERCIAL SOYBEAN STOCKS.** Production and Marketing Administration's commercial grain stock reports for the first four Tuesdays in September.

U. S. SOYBEANS IN STORE AND AFLOAT AT DOMESTIC MARKETS (1,000 bu.)

	Sept. 2	Sept. 9	Sept. 16	Sept. 23
Atlantic Coast	7	7	3	4
Northwestern & Upper Lake	104	94	80	44
Lower Lake	61	37	24	12
East Central	108	175	34	59
West Central,				
Southwestern & Western	0	74	51	21
Total current week	280	387	192	140
Total year ago	531	408	324	245

• **INSPECTIONS.** Inspected receipts of soybeans decreased seasonally in August and totaled only 1,096 cars compared with 1,728 cars in July, according to reports to the Department of Agriculture. The average for the month of August for the crop years 1940-45 was 1,176 cars. Inspected receipts October through August this season were 83,293 cars compared with 83,882 cars for the same period last season.

The quality of soybeans inspected in August was somewhat higher



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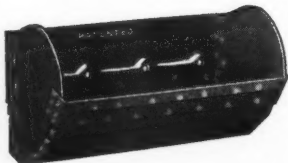
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than for the preceding month, 71 percent grading No. 2 or better compared with 67 percent in July. Of the October-August receipts this year 70 percent graded No. 2 or better compared with 91 percent last year.

Inspections of soybeans in August included the equivalent of 1 car inspected as cargo lots and truck receipts equivalent to about 26 cars.

● **SOYBEAN OIL CONSUMPTION.** Factory consumption of crude soybean oil totaled 322,328,000 pounds in the second quarter of 1947; consumption of refined soybean oil totaled 248,818,000 pounds.

Edible usage of the refined oil included: (lbs.) shortening 127,679,000; margarine 42,889,000; other 9,354,000. Inedible uses of the refined oil: soap 715,000; paint and varnish 20,197,000; linoleum and oilcloth 6,153,000; printing inks 160,000; lubricants and greases 47,000; other 8,884,000.

Usage of crude oil during the second quarter of 1947 (lbs.): soap 1,181,000; paint and varnish 2,364,000; printing inks 9,000; lubricants and greases 133,000; other 9,915,000.

● **SOYBEAN GLUE IN PLYWOOD.** Soybean glue consumed by the softwood plywood industry in July totaled 1,556,000 pounds, reports Bureau of the Census. This compared with 2,139,000 pounds in June, and 1,617,000 pounds in July 1946.

Phenolic resin glue used by the industry in July was 2,007,000 pounds; casein glue, 365,000 pounds; other 211,000 pounds. Total glue consumed in July was 4,139,000 pounds.

July glue stocks in pounds: casein 301,000; soybean 1,023,000; phenolic resin 1,809,000; other 650,000.

● **NO SOYBEAN OIL TO CCC.** The U. S. Department of Agriculture has announced that only one offer was received from the trade (and subsequently withdrawn prior to the time of acceptance) in response to a request by the Commodity Credit Corporation for offers on contemplated purchases of bulk cottonseed and soybean oils by the CCC.

The CCC purchase proposal was sent to the trade August 29, calling for offers on cottonseed and soybean oils in tank cars for September and October deliveries.

● **STANDARD SHORTENING SHIPMENTS.** Reported by members of Institute of Shortening Mfrs., in pounds.

September 6	4,039,999
September 13	7,591,324
September 20	9,070,742
September 27	10,376,447



Government Orders

● **EXPORT ALLOCATIONS.** The U. S. Department of Agriculture announced fats and oils export allocations totaling 452.5 million pounds for the fourth quarter of 1947. This amount includes 36.3 million pounds allocated to export claimants in exchange for other fats and oils needed in the United States. For the fourth quarter of 1946, final export allocations totaled 176.8 million pounds.

The October-December commercial allocations include (in fat content) 74.6 million pounds of lard, 5.2 million pounds of margarine, 100.2 million pounds of shortening and other edible oils, 15.5 million pounds of drying oils, 33.1 million pounds of other inedible fats and oils, 17.1 million pounds of soap, and 86.0 million pounds of peanut oil as peanuts (100,000 short tons of shelled peanuts).

In addition to the 331.7 million pounds of commercial export allocations, 120.8 million pounds of all types of fats and oils are allocated for procurement by the Production and Marketing Administration for the U.S.-U.K. Occupied Zones in Germany and for countries receiving aid under the U. S. Foreign Relief Program to be administered by the Department of State.

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GENERAL
REVIEW

Soybean Digest



Official Publication

OF

THE AMERICAN SOYBEAN ASSOCIATION

VOLUME 7 • NUMBER 12



OCTOBER • 1947

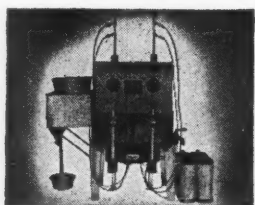
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Seedburo handles all leading makes of commercial moisture testers . . . a unit to solve your particular moisture testing problem.

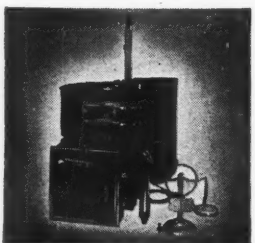
Moreover, Seedburo is headquarters for Moisture Testing "know how". Since 1912 the technical men of this organization have specialized in moisture

analysis of grains, feeds, chemicals, foods and other products. They will share their experience and knowledge with you without cost or obligation.



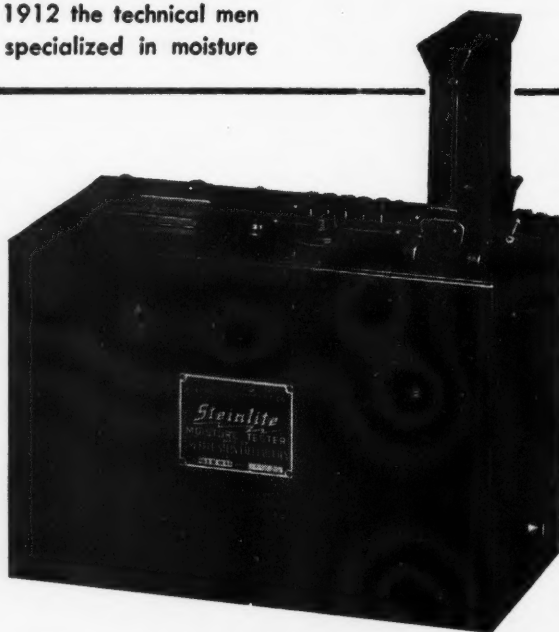
BROWN-DUVEL

Now equipped with the NEW Electric Automatic Shut-Off, saves more than 75% of the time otherwise required in making tests. Ideal for use where volume of samples is small. Tests 1, 2, 4 or 6 samples at once. Tests whole grain only. Illustrated is two compartment tester with automatic electric shut-off.



BRABENDER

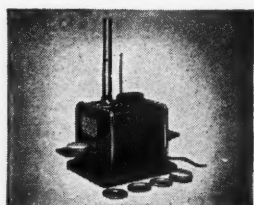
Combination of a modern drying oven and an analytical balance. Combines speed with the precision of analytical methods. Moisture loss is read from side graduated in percentages. Used in laboratory and production. Ten samples can be run at once. Drying time 15 to 40 minutes depending upon commodity.



***Steinlite* ONE MINUTE TESTER**

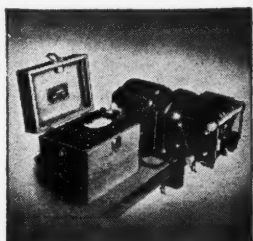
Steinlite is the most popular rapid tester on the market for determining the moisture content of whole and processed grains. There are more in operation than all other makes of electric testers combined—over 10,043 elevators, mills and food processing plants are equipped with the Steinlite.

Steinlite operates on the radio frequency impedance principle. Calibrated against official oven methods and guaranteed to give comparable results. No technical knowledge is required, and no previous experience. Steinlite is fully guaranteed for one year. It is sold on a ten day free trial basis. No money down.



CARTER-SIMON

Recognized as a quick and reliable moisture testing oven for laboratory tests on all materials. Make accurate tests in 15 minutes or less. Three samples may be in the process of testing at one time. Moisture percentage is obtained by multiplying "loss in weight" by 20. A precision built instrument.



TAG-HEPPENSTALL

A reliable method for determining the moisture content of grain—used only on whole grains. Calibrated against the water oven method for corn; against the air oven method for other grains. Requires no weighing of samples. Standardized in a few seconds by merely adjusting a rheostat.

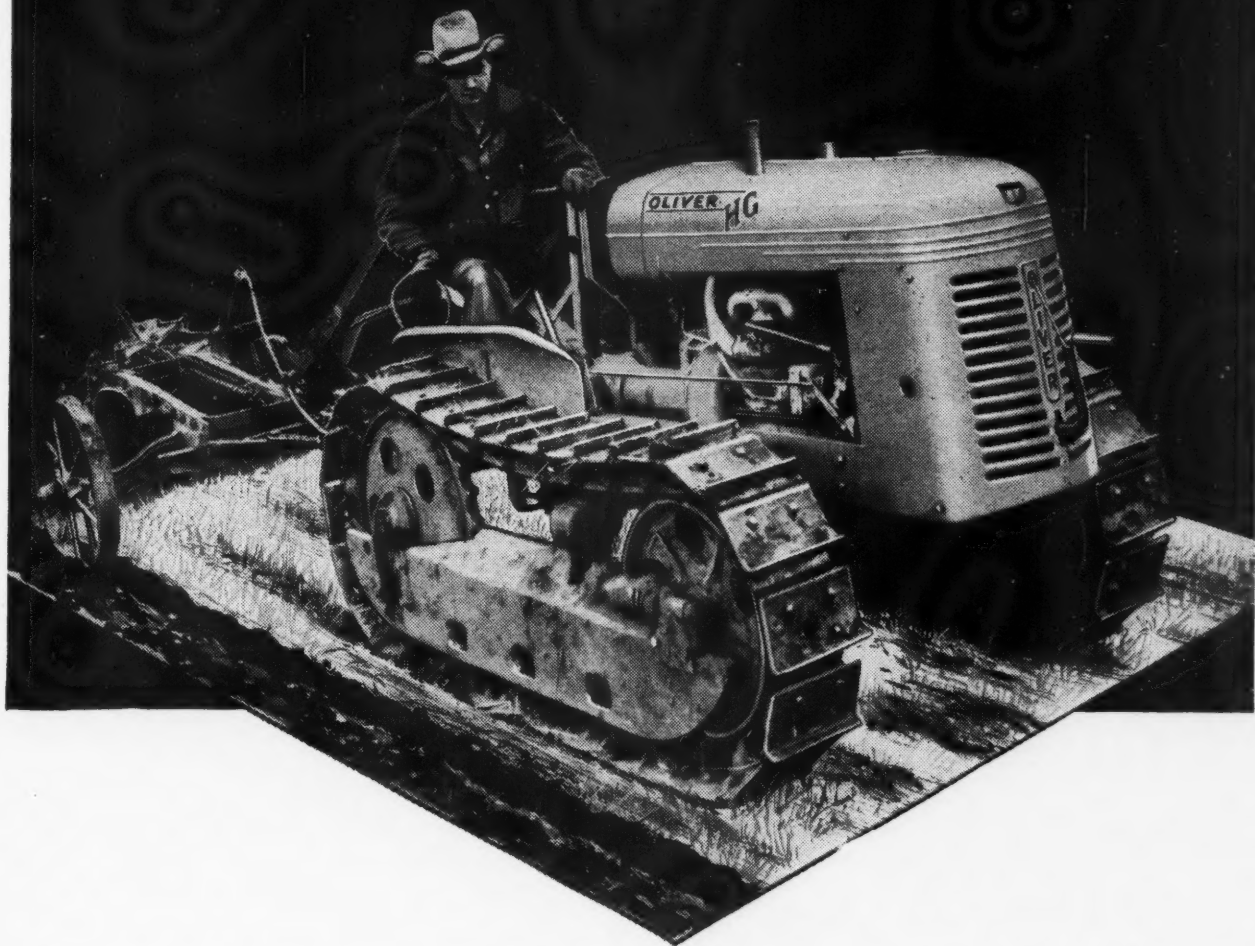
EQUIPMENT "CENTER"

Prompt shipments on over 500 items of seed, grain and mill equipment . . . blowers, bag trucks, scales, respirators, germinators, and a host of other products. Check your requirements and send in your order today. It's easy to buy by MAIL!

SEEDBURO
EQUIPMENT COMPANY

729 CONVERSE BUILDING • CHICAGO 6, ILLINOIS

Anytime is "HG" time



In any kind of weather, on any kind of going, the Oliver HG can go on working. Sand, mud or snow... hills, marsh or bottom land do not give you idle days when you have an HG.

The HG is a track tractor that is made for the farm—it *will handle row crops!* It comes in either 31, 42 or 68-inch tread widths, center-to-center, and has a full 20-inch clearance.

It's a great second tractor for the average

two-tractor farm because it's an all-winter tractor. See your Oliver Dealer and ask him about the HG. The Oliver Corporation, 400 West Madison Street, Chicago 6, Illinois.

OLIVER Track-Tractor is an ideal "2nd tractor" on many farms. It can be fitted with a blade for erosion control, road maintenance or snow removal and with many other accessories.

OLIVER

"FINEST IN FARM MACHINERY"



H. H. WILLARD, PROFESSOR
DEPARTMENT OF CHEMISTRY
UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN

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HOW SKELLYSOLVE SERVES THE OIL AND FAT INDUSTRY

There are six different types of Skellysolve especially adaptable for efficient extraction of corn germ, soybean, cottonseed, meat scrap, and other vegetable or animal oils.

Skellysolve offers you the *right* solvent for your own particular requirements; each has the correct boiling range needed, and other necessary properties to meet the exacting demands of the oil and fat industries.

There is a trained Skellysolve technician to help you in the solution of your problems. Write today for complete information on Skellysolve and Skellysolve service.

Here's why!

Skellysolve is unequalled in purity, uniformity, and stability. Because we have long pioneered in the development of extra-quality industrial naphthas, the name Skellysolve assures you of the finest characteristics, closest cuts, constant uniformity, and low evaporation losses.

Here's why!

Source of supply is unequalled for dependability and swiftness. We have the raw materials, the plants and equipment, the experience, and even more important—the *will* to serve you! Further, Skellysolve is shipped in cars used for no other purpose. There's no chance of contamination or mixture with other materials.

Here's why!

A wide variety of special naphthas assures you of the right type of Skellysolve for your particular operation—assures better products, more uniform products, more economy in production.

Here's why!

New technical developments make Skellysolve even finer today than in the past. You'll save time, money, and trouble by checking Skellysolve properties and prices first. Write or wire for information.



SKELLYSOLVE

SOLVENTS DIVISION, SKELLY OIL COMPANY
SKELLY BLDG., KANSAS CITY, MISSOURI

